THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$2.00 A COPY; $44/YEAR JUNE 11, 1984 VOL. XVIII, NO. 24

Stress in the DP shop
The toll it's taking on your staff/**23**

In Depth
How important is subsecond response time?
Follows 96

Technology Spotlight
Emerging wireless transmission methods/**14-15**

Micro software prices holding

Despite stiff competition, low-cost IBM programs

By Eric Bender
CW Staff

Despite the dog-eat-dog competition in microcomputer software sales and all the publicity that IBM received last month when it introduced low-cost programs for its Personal Computers, prices for most premium business software are holding steady, vendors and industry analysts interviewed recently agreed.

"The market is becoming more consumer-driven," noted Richard Rabins, president of Alpha Software, Inc. in Burlington, Mass. Customers are generally demanding — and getting — more features for their money, Rabins said.

In addition, the cost per application is dropping for new, integrated packages such as Lotus Development Corp.'s Symphony, which will provide five basic functions for $695.

Increased competition among distributors and dealers also drives software prices down. But most market-leading packages have resisted this trend, Rabins and other vendors pointed out.

One possible exception is data base management systems. Ashton-Tate dropped the list price on its highly popular Dbase II by $200 last month when it introduced Dbase III. The Culver City, Calif., company also signed new distributor contracts that are expected to place large quantities of Dbase III on the market. Combined, the moves are likely to create massive discounting in street prices, some distributors predicted.

See **PRICES** page 11

Post office opts to kill Ecom service

By Phil Hirsch
CW Washington Bureau

SAN FRANCISCO — The U.S. Postal Service's money-losing Electronic Computer-Originated Mail service, launched in January 1982, will be terminated, the agency's governors decided here last week.

The governors, who did not state a reason for their decision, directed USPS management to file a request for termination of the bulk electronic mail service with the U.S. Postal Rate Commission within 30 days, marking the first step in the shutdown. Postal Service officials also were directed to "arrange for the disposal of all Ecom equipment by means of sale or lease."

How long it will take to end the service remains unclear. There is a chance that present users, because of the low rates they are paying, will try to keep Ecom alive by delaying the Postal Rate Commission's action on the upcoming termination request (see story on page 6).

However, the Postal Rate Commission's assistant general counsel, Stephen Sharfman, doubts that the commission's proceedings will take very long. "Hearings cost money," he pointed out, meaning that even if an Ecom user wanted to continue exploiting the low rates, the cost could exceed the benefits.

Another unknown is when Ecom's assets, which a USPS spokesman said are worth about $40 million, will be dispersed. Last week's announcement did not stipulate a deadline, and the spokesman declined to speculate.

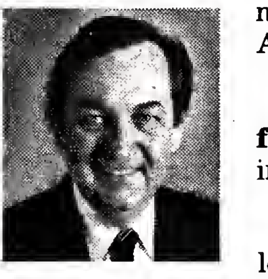
If the termination process takes too

See **ECOM** page 6

TOP OF THE NEWS

Datapoint Corp. broke a long silence last week by bringing out its first new products in over a year. Topping the list was its first personal computer. **Meanwhile, Grid Systems Corp. made more room for itself in the micro market** by introducing three more briefcase-size personal computers. **Page 4.**

■



A master showman who delights in giving Management Science America, Inc. software users something besides software to talk about at their annual meetings, Chairman of the Board John Imlay recently shared some of his visions with *Computerworld*. **Page 17.**

■

Florida software companies and users are breathing easier. The state legislature recently failed to approve a bill that would have made custom software subject to state sales taxes. **Page 9.**

■

The early bird gets the users: A Massachusetts bank that made an early commitment to automated teller machines is maintaining a 25% annual growth in ATM transactions. **Page 113.**

■

How much for that old IBM mainframe in the back room? A study examines trade-in values. **Page 121.**

■

Moving into new markets are two leading software firms, Cullinet Software, Inc. and Mathematica Products Group, Inc. **Page 137.**

■

FYI

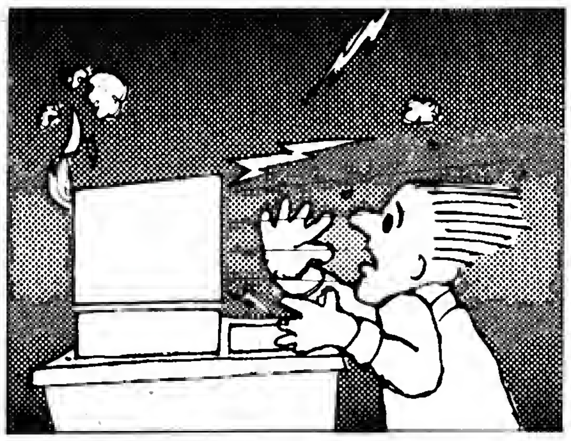
Computer crashes: A case of mind over matter?

By John Desmond
CW Staff

People who seem to cause computers to break down or who have anxiety attacks when they use computers may or may not be jinxes, but they are definitely not alone.

A Syracuse University researcher of engineering anomalies is studying why some people seem to jinx computers and other microelectronic devices. Dr. Robert Morris, research coordinator at the Syracuse Communication Studies Laboratory, will present his findings on computer anxiety to the annual meeting of the American Parapsychological Association when it is held the first week of August in Dallas.

In one experiment, Morris found a link between a negative attitude toward computers and a higher frequency of crashes. "It looks to us as though some people anomalously interact with equipment" in a way that produces frequent breakdowns, he said in a recent interview.



Pete Barokas

Morris refers to such jinxes as "malfunction-linked" people, while he calls those without such problems "function-linked."

Malfunction-linked people identified in a technology attitude questionnaire constituted 13 of Morris' 33 subjects. During the experiment, the computer crashed only when one of those 13 was using it; it never crashed for any of the 20 subjects who had no computer anxiety.

The researcher has several theories why that happened; they range from simple misunderstanding of instructions by the operator to the possibility that an electromagnetic charge was generated by the tenseness of the operator. One unconventional theory, drawn from psychic research, suggests that psychokinesis — the ability to move physical objects with the mind — is at work. Engineering research at Princeton University has focused on the possibility that the power of mind over matter could affect the

See **CRASHES** page 8

NEWSPAPER

NEWS SUMMARY

After more than a year of new product inactivity, Datapoint Corp. brought its first personal computer to market/**4**

Grid Systems Corp. extended its Compass briefcase personal computer family at both the high and low ends/**4**

Reacting to the coming termination of the U.S. Postal Service's Electronic Computer-Originated Mail service, one user said he may sue the U.S. government, while another hopes to buy the service/**6**

Uri Geller, the world's most famous practitioner of psychokinesis, has applied his powers to microelectronics/**8**

A proposal in the Florida State Legislature to subject customized software to the state sales tax got lost in the shuffle of last-minute politicking/**9**

CW at Robots 8: General Motors Corp.'s Fisher Body Division has taken a major step in the transformation of the robot from a stand-alone worker to a team player . . . The best reason for acquiring a manufacturing robot is also the most obvious: reducing labor costs, according to several executives and engineers/**10-11**

CW at the National Retail Merchants Association Conference: The widespread acceptance of automated merchandising and a dramatic increase in specialized software are changing the face of the retail industry . . . Micros are seen as altering the nature of MIS in the retail industry/**12-13**

PRODUCT SPOTLIGHT: Emerging Wireless Transmission Methods/**14-15**

Codex Corp. and the state of Massachusetts reached an accord that will allow the data communications firm to construct its world headquarters on historic farmland/**16**

A legal battle in Illinois is pitting a service bureau against a county government, with $10,000 in fees and $1.3 million in lost interest income at stake/**16**

CW interviews John Imlay: Management Science America, Inc.'s chairman of the board looks ahead/**17**

Operations people live the "no respect" life of Rodney Dangerfield, the head of the Association for Computer Operations Managers said/**19**

The National Council of Churches systems director is a one-man DP department/**22**

Stress in the DP Shop (Part 1): Is the high price of stress costing your organization staff members?/**23**

Users at a seminar on IBM System/34 to System/38 upgrades were told that a holistic view is key in IBM systems change/**26**

A U.S. House of Representatives subcommittee, continuing its hearings on the health effects of VDTs, heard more testimony opposing government regulation/**28**

A manufacturer of disposable plastic components found a file retrieval system that cuts report generation time/**30**

A Florida school system gave a minicomputer network high marks/**31**

Microcomputer tools have trimmed report costs for American Express Co./**32**

A comparison of DP salaries in France, Belgium, England and Spain indicated that the big winners are the French/**33**

IBM offered new proposals to the European Economic Community in an attempt to end a lengthy antitrust suit/**34**

A Singapore company has established a 50-50 joint venture with a Chinese organization to manufacture an IBM-compatible "Third-World micro" in China/**34**

MIS professionals are taking increasing advantage of training methods to improve their public speaking skills/**37**

By the year 2000, the typical automated office environment will be noisier and less comfortable than it is today unless computer manufacturers and office furniture makers combine to design proper desks, chairs, lighting and equipment, a management foundation survey said/**41**

Microcomputers have spawned a generation of large system users demanding real-time systems, a software vendor said at a recent forum/**46**

Increased productivity awaits the next generation of microcomputer users, according to a software architect/**47**

Israel's minister of science and development recently unveiled a $160 million national program to develop a computer-aided learning system/**48**

A conversion from IBM terminals to IBM Personal Computers and a micro-to-mainframe link package has reduced DP costs and improved communications for one major insurance company/**49**

Blue Cross/Blue Shield's compression needs prompted a software search for cost savings on disks as well as better security/**50**

A Coca-Cola bottler lauded multiuser micros as the firm's paper glut was reduced/**51**

An applications generator helped a major microcomputer software company begin upgrading its telemarketing system/**54**

Automation is helping a New Jersey ironworks survive in a tight economy/**55**

A trucking firm is tracking supplies with computerized inventory/**56**

A university was forced to make a quick systems decision after learning that Sperry Corp. was canceling support for its Series 90 mainframes/**57**

Northwestern Bell Telephone Co. is calling on supermicros to trace cables/**60**

A package is managing Florida's Department of Highway and Safety and Motor Vehicles network/**61**

A Texas office furniture and supply company claimed to have increased its sales volume since installing a minicomputer system/**63**

A Texas bank's service capabilities profited from an integrated network/**65**

A superminicomputer does the tricks for a computer graphics firm/**66**

A Massachusetts university updated its system while changing its image/**68**

A manufacturer of avionics equipment slashed its book-closing time with a general ledger tool/**69**

A software firm is helping an oil firm keep track of its cash flow/**70**

A New Jersey bank credited software for providing it with a competitive edge/**71**

Language-directed editors are said to ease programmers' work/**73**

The University of Chicago takes a dual approach to cutting backlog, as user programming and fourth-generation tools help the school fulfill requests/**74**

A workstation was seen as a boon to programmer productivity/**77**

Data management tools have cut an oil firm's development time/**79**

Businesses benefited from on-line transaction processing as systems development architecture boosted programmer productivity/**81**

Application generators: They just get no respect/**83**

Telecom Briefs/**29**
International Report/**35**
Managers on the Move/**36**
Turnaround Time/**40**
Off the Press/**43**
Call for Papers/**84**
Calendar/**85-86**

IN DEPTH

Subsecond response time/
Follows 96
In defense of Cobol/**ID/19**
Maintenance no more/**ID/27**
Developing system code/**ID/41**

EDITORIAL/88
SOFTWARE & SERVICES/97
COMMUNICATIONS/113
SYSTEMS & PERIPHERALS/121
MICROCOMPUTERS/127
COMPUTER INDUSTRY/137

Fagan gets publisher's post at CW

FRAMINGHAM, Mass. — Donald E. Fagan has been named publisher of *Computerworld*, a position that had been held for the entire 17-year history of the publication by Patrick J. McGovern, founder and chairman of CW Communications, Inc. (CWCI). Fagan's appointment took effect June 1.

Fagan

"Pat and I have decided it is time for *Computerworld* to have someone who could devote all his efforts to the position of publisher," said W. Walter Boyd, president of CWCI. "We could think of no better person for this important job than Don Fagan."

Fagan has been with *Computerworld* 15 years. He joined the newspaper as a New York sales representative in 1969 and subsequently became regional director for the Eastern sales region. In 1981, he was promoted to vice-president/sales, and most recently, he was vice-president/sales and marketing with responsibility for *Computerworld*'s 21-person national sales force.

"I have seen *Computerworld* grow from modest beginnings in 1967 to become the No. 1 trade publication in the U.S. and the 53rd largest publication of any type in the U.S.," Fagan said. *Computerworld* is the flagship publication of CWCI, which publishes more than 52 newspapers and magazines in 25 countries and had annual revenues in 1983 of $90 million.

Geisco wins Nacha contract

WASHINGTON, D.C. — The National Automated Clearing House Association (Nacha) last week picked General Electric Information Services Co. (Geisco) over McDonnell Douglas Automation Co.'s McAuto computer services division to operate an electronic payment system for the nation's banks.

The Federal Reserve Board currently handles the automated clearing of checks and financial settlements for the nation's banks on its own computer system. Maintaining that a conflict of interest existed for the Federal Reserve, Nacha — which represents 19 regional automated clearinghouses — has been pressuring the Fed to get out of the business of operating a check clearing and processing system while at the same time monitoring the financial health of banks.

To date, only in New York has a private-sector Automated Clearinghouse system been successfully set up and operated.

Geisco will provide a 24-hour, unlimited capacity, continuous flow processing and data confidentiality service for Nacha.

ADR® WARE™

ADR®/DATACOM/DB®

Has the only migration software that converts your applications from VSAM to a relational data base management system. Overnight.

We've taken state of the art to a new state: Easy and available.
Before you make a software decision mail in the coupon below.
Or call in N.J. (201) 874-9000 or toll free
1-800-ADR-WARE.

DB

☐ Please send me more information about ADR WARE.
☐ Please send me information about ADR seminars.

APPLIED DATA RESEARCH INC.
Route 206 & Orchard Road, CN-8, Princeton, NJ 08540

Name____________________
Position____________________
Company____________________
Address____________________
City__________ State________ Zip________
Phone Number____________________
Computer Equipment____________________

ADR® WARE™
From idea to application, we get you there faster.

Datapoint joins micro fray with 16-bit, MS-DOS entry

By David Myers
CW New York Bureau

NEW YORK — After over a year of new product inactivity, Datapoint Corp. came to market here last week with its first personal computer, a private-label version of Convergent Technologies, Inc.'s 16-bit N-Gen in both dual disk and hard disk models, as well as additions to its office automation network line of products.

The San Antonio, Texas-based maker of local-area networks and minicomputers also stated its intention of opening up its Arcnet network for direct integration of IBM Personal Computers, as well as enhanced data communications capabilities with IBM mainframes under the 3274 Systems Network Architecture (SNA).

Datapoint also took the opportunity to introduce a fiber-optic link that can extend from its previous length of 2,000 ft to 4,000 ft the distance between the standard Arcnet junction-box hubs.

Two versions of micro

Leading off last week's announcements, Datapoint introduced a $4,795 dual-disk-drive personal computer and a $6,995 hard disk version, both named the Vista-PC. Based on the Intel Corp. 80186 microprocessor chip, the Vista-PC comes with 256K bytes of random-access memory in its floppy disk incarnation or 1M byte of storage in the hard disk version.

Both models come with an eight-color, 720- by 348-pixel monitor as a standard feature and run Microsoft, Inc.'s MS-DOS operating system. However, the Datapoint version of the Convergent product, unlike versions introduced by other vendors, will not run Digital Research, Inc.'s CP/M operating system, according to the company.

In December, Datapoint will announce a capability to link up the Vista-PC with its five-year-old local-area Arcnet, the company said. The microcomputer will emulate a Datapoint 8220 workstation when it operates on the network, according to Datapoint.

To complement its new micro, Datapoint announced proprietary software offerings, including a $700 software package called Color-Pac, which includes an interface between various applications packages.

Color-Pac also reportedly includes a context manager program enabling the concurrent execution of up to 10 tasks, a full-color word processing package, Microsoft's Multiplan financial modeling program and color business graphics.

The Vista-PC also supports software development tools, such as Microsoft's GW-Basic, the Datapoint Databus programming language and Datapoll communications software, according to the company.

The new microcomputers can be clustered in groups of six to share resources and information, Datapoint said. It said the Vista-PC supports IBM's 2780/3780, 3270 stand-alone and 3270 cluster, RJE/SNA and X.25 protocols, as well as an asynchronous terminal emulator.

Datapoint Corp.'s Vista-PC

A $1,895 color plotter, the Model 9656, is available with the personal computer for graphics output. A letter-quality printer is also available for $2,795.

In its announcements last week, Datapoint also introduced what it called a fourth-generation windowing software product. Called Vista-View, the software can run eight concurrent programs under Datapoint's RMS operating system.

Allows merging of data

Datapoint said the software permits users to look at information from multiple active office applications simultaneously and to merge that information into an understandable composite.

The company added that the windowing product will run any of Datapoint's office automation software applications, including its Vista-Guide user interface, Vista-Word word processing, Vista-Mail electronic mail and Microsoft's Multiplan. However, it will not run on the newly announced Vista-PC microcomputer and, therefore, will not run popular microcomputer products such as Lotus Development Corp.'s 1-2-3 integrated financial spreadsheet package.

The windowing software will be licensed at $1,000 for every Arcnet network installation, according to Datapoint.

Datapoint also unveiled an Intel 80286-based applications processor called the Vista-Station-84 and a multifunction terminal called the Vista-Station-82.

As part of an Arcnet network, the Vista-Station-84 processor incorporates from 512K bytes to 1M byte of error-correction code memory, an RS-232C communications interface to a local serial printer and an RS-232 or RS-422 serial communications interface for terminal operations, according to Datapoint. It sells for $8,550 and is available now.

The multifunction terminal provides high-speed I/O support through an RS-422 link to the applications processor in an Arcnet network and is equipped with user-defined, preprogrammed function keys. The Vista-Station-82 sells for $2,295 and is also available immediately from the vendor.

More information is available from Datapoint, which is headquartered at 9725 Datapoint Drive, San Antonio, Texas 78284.

Grid adds three micros

Also expands software options, cuts prices

By Jeffry Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — Grid Systems Corp. last week extended its Compass briefcase personal computer family at both the high and low ends, trimmed the prices of its existing Compass I models and expanded its selection of management software packages.

At the top of its personal computer line, Grid added the Compass II series, which currently consists of two microcomputer models, the 1121 and the 1129. At the bottom end, the company broadened its processor family with the addition of the Model 1705, a workstation that operates with Grid's existing network server.

Grid also announced that its networking system now integrates both IBM Personal Computers and Grid products in a remote-area network, allowing access by 58 simultaneous users.

The introduction of the firm's three latest briefcase personal computers prompted Grid to cut by 23% to 30% the prices of its two-year-old Compass I microcomputers, the Models 1100, 1101 and 1109.

Three additional programs

In a related product move, Grid also enhanced its processors' software capabilities with the release of three additional management programs:

- Grid Access, which reportedly improves the functionality of the company's telephone handset and allows both voice and data messages to be transmitted between Compass personal computers.
- Grid Transfer, which is said to permit Microsoft, Inc.'s MS-DOS data files to be converted into a form compatible with Grid's own operating system and vice versa.
- Grid Record/Playback, which reportedly streamlines and speeds the execution of repetitive tasks by replacing long sequences of necessary keystrokes with single commands.

In their basic configurations, the two Compass II models cost the same as their Compass I sister systems, but accommodate at least 33% more memory, according to Grid's vice-president of marketing, Alan Lefkof. When fully expanded, the Compass II's edge in storage capacity reportedly widens to 300%.

In their minimum configurations, both the Compass II Models 1121 and 1129 come with one 128K-byte read-only memory (ROM) pack and can expand to support up to three additional modules, for a total ROM capacity of 512K bytes.

The rest of the Compass II's software, including products such as Lotus Development Corp.'s 1-2-3 integrated applications package, currently reside in bubble memory, according to Grid's hardware marketing manager, Stephen Holtzman.

The strategy of executing programs directly in ROM liberates random-access memory (RAM), which would otherwise be consumed by overhead functions, said the firm's marketing director, Jack Aiello.

Both the Compass II Models 1121 and 1129 reportedly come with 384K bytes of fixed bubble memory. The 1129, however, supports 512K bytes of RAM, twice the capacity of its Compass II sister system. So with its full complement of four ROM packs, the larger of the two personal computers stores a total of 1.4M bytes.

Like their Compass I counterparts, the 1121 and 1129 are built around Intel Corp. 8086 and 8087 microprocessors, incorporate 25-line flat-panel displays and weigh about 18 lb.

Line includes seven models

In the wake of last week's product introduction, Grid's personal computer line now embraces seven models, all of which are geared mainly for mobile professionals, except for the 1705 workstation.

Because it lacks both ROM and bubble memory, the 1705 depends for its mass storage on either a network server or an external Winchester disk system and thus is unsuitable for on-the-road applications, Aiello said.

Prices for the 1705, 1121 and 1129 start at $3,450, $6,795 and $7,995, respectively, with the optional ROM packs selling for an additional $225 each.

All the personal computers are available for immediate delivery from Grid at 2535 Garcia Ave., Mountain View, Calif. 94043.

Second-class postage paid at Framingham, Mass., and additional mailing offices. *Computerworld* (ISSN-0010-4841) is published weekly, except: January (6 issues), February (6 issues), March (5 issues), April (7 issues), May (5 issues), June (7 issues), July (6 issues), August (6 issues), September (6 issues), October (7 issues), November (6 issues), December (6 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/ Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Copyright 1984 by CW Communications/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microform through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc. Box 880, 375 Cochituate Rd., Framingham, MA 01701. **ISSN 0010-4841/84 $3.00 + $.50**

$2.00 a copy: U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

ABC ABP MCC MEDIA DATA FORM

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

TRIPLE CROWN

Introducing Sort Racing's Colt of the Year! (SyncSort DOS, Release 1.6.)

Call (201) 568-9700.

What you save ain't hay.

Hello, sort-racing fans! We bring you this report direct from the main clubhouse here at historic old SyncSort Farms, which has been called "the birthplace of sorting champions."

That glossy young colt you see kicking up its heels out there in the main paddock is the latest in a long line of SyncSort Triple-Crown winners. It's SyncSort DOS, Release 1.6. And it's been causing a sensation around the world's DOS/VS(E) tracks.

Here are some of the top honors it's already captured:

(1) THE PERFORMANCE CROWN: SyncSort DOS, Release 1.6 is a chip off a couple of good old blocks. Its daddy was High Technology, and its mommie was that celebrated brood mare State of the Art.

Like all its famous ancestors, Release 1.6 eats lightly of computer resources but moves very fast indeed. It's bred especially to provide dazzling performance on the 4300 series, with their Fixed Block Architecture and VSAM-type of data.

Compared to that venerable old oat burner IBM's 5746-SM2, Release 1.6 can save you up to 50% in CPU Time and up to 70% in SIOs, as the charts below indicate.

(2) THE PRODUCTIVITY CROWN: SyncSort DOS has always been a favorite with sort jockeys because it's so easy to handle. Advanced features reduce the time required for simple reports from five days to one.

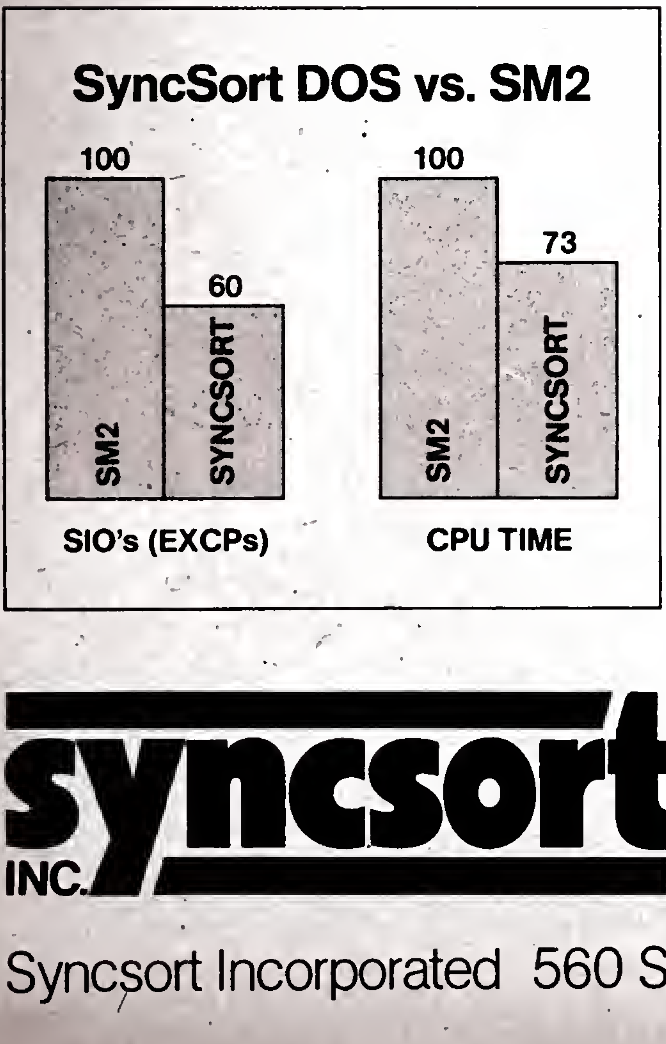
Now Release 1.6 adds another popular new capability. The Sortwriter feature makes it possible to specify reports in virtually any format you require.

With a single pass of the sort, Release 1.6 can manipulate data and present the output in a wide variety of formats — with headings, trailers, totaling and sub-totaling, dating, spacing, line-skipping, character insertion, and data-format conversion.

(3) THE SERVICE CROWN: One of the reasons that SyncSort has over 6,500 users all around the world, is that we look out for the people who use our products. Our Technical Service is fast, accurate and courteous. More than 85% of all customer inquiries are resolved within 24 hours.

If you'd like to see how SyncSort DOS, Release 1.6 performs on your turf, give us a call. We'll be glad to help you set up a little "sortstakes" that will match Release 1.6 against your present sort.

After that improving the breed of your sorts should be no trouble at all.



syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Ecom termination elicits varied but strong reactions

By Phil Hirsch
CW Washington Bureau

One user said he may sue the U.S. government. Another hopes to buy the U.S. Postal Service's soon-to-be-terminated Electronic Computer-Originated Mail (Ecom) service. And a major competitor offered to transfer some Ecom users to his service — at no charge.

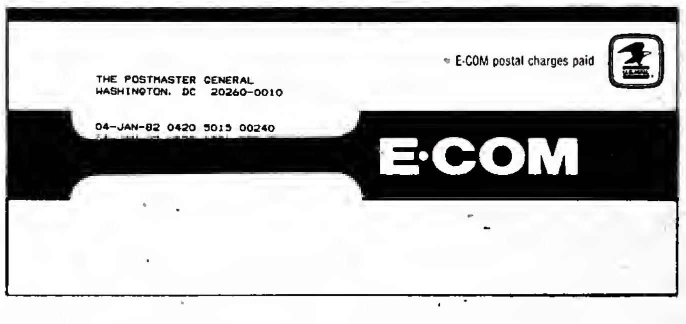
Those were several of the initial, diverse reactions last week to the news that the U.S. Postal Service will get out of the electronic message business.

Ecom user James Young, who will "talk to [his] lawyer" soon, contended that he was persuaded by the Postal Service to buy a $300,000 Ecom terminal system. Young is president of Automotive Incentive Development Co., a direct-mail firm located in Temperance, Mich., a suburb of Toledo, Ohio.

About 20% of his company's direct-mail pieces now are transmitted via Ecom; the rest are presorted and sent first class. When Ecom began, Young relied totally on the service and reportedly was its largest single customer.

U.S. Postal Service salesmen, he said, misrepresented the service. Moreover, he maintained, the Postal Service had no right to end Ecom without warning users.

Young said he has talked to other users who feel the same way. In the meantime, he will continue using Ecom.


THE POSTMASTER GENERAL
WASHINGTON, DC 20260-0010
04-JAN-82 0420 5015 00240
E-COM postal charges paid
E·COM

Michael Brown, a spokesman for Netword, Inc. of Riverdale, Md., another Ecom user, said his company is talking to unnamed "others" about the possibility of acquiring Ecom. Brown said he thought the service, if acquired, could be priced somewhat higher than at present, but not as high as the rates proposed by the U.S. Postal Rate Commission — 49 cents for a one-page letter and 14 cents more for two pages.

Offering a business reply envelope, doing away with the 200-message minimum and allowing messages of more than two pages would make the service viable, Brown added. Reminded that the Postal Service had proposed the first two changes, Brown attributed the agency's bail-out decision to politics — an apparent reference to the efforts of Ecom's competitors to scuttle the service.

The offer to transfer some present Ecom users to a competing service at no charge came from Robert Harcharik, president of MCI Digital Information Services Co., which operates MCI Volume Mail Service. Asked how a user could qualify, Harcharik said the company would have to generate 50,000 to 100,000 messages a month.

MCI, he said, is interested in discussing the acquisition of Ecom, but he made it clear that the service, if acquired, would cost users much more than they are now paying. But he also said that if the price has to be in the range of 50 cents per message, there would be little point in acquiring Ecom because, he said, MCI Volume Mail is a better quality service and costs only a little more.

ECOM from page 1

long, U.S. Congress is likely to object. Last week, Rep. Glenn English (D-Okla.), a persistent Ecom critic, said that "USPS is losing about $1 on each message it handles. . . . The longer it's offered, the more money the Postal Service stands to lose."

When asked whether USPS personnel might continue operating Ecom under contract to a private owner/lessor, the post office spokesman said such an arrangement is possible. At least one Ecom user already has expressed an interest in buying the service.

Early trouble

Even before it went into commercial operation in January 1982, Ecom was in trouble with Congress, private vendors of electronic message services and the Department of Justice. All complained that government competition in this arena was unnecessary, particularly since the rates for Ecom — 26 cents for the first page and five cents for the second — were too low to meet its costs and would force first-class mail users to make up the difference.

In response to the criticism, the Postal Service proposed, in April 1983, to increase the rates to 31 cents for the first page and 9 cents for the second. But that did not help.

Last December, the *Washington Post* reported that one customer — Automotive Incentive Development Co. — accounted for 50% to 75% of Ecom's total volume. The company's president, James Young, was quoted as saying that if the proposed rate increase was implemented, his company would stop using Ecom.

An even bigger problem was the agency's somewhat underhanded attempt to change Ecom. Under the original charter, the service was designed for bulk mailers that had to send at least 200 messages at a time. The messages were to be transmitted on-line to a post office near the addressee, where they would be printed out, enveloped and delivered by a letter carrier.

However, when it proposed the higher rates, the USPS also proposed doing away with the 200-message minimum. And early this year, Ecom Director Karen Uemoto admitted that at least 30% of all Ecom messages were being received at a postal center near the sender rather than the receiver, eliminating communications costs for the sender and thus making the service more attractive.

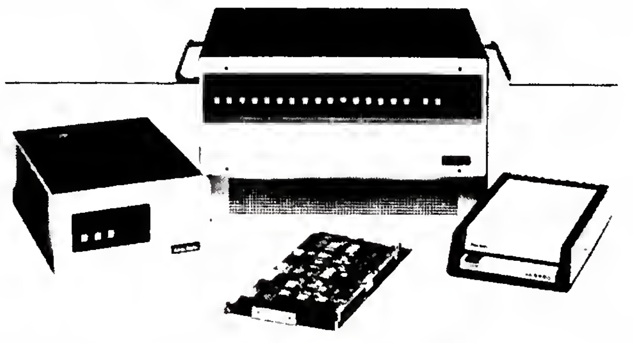
Despite these measures, Ecom failed to live up to its advance billing. When commercial operation began in January 1982, postal officials said they would handle at least 50 million Ecom messages during fiscal year 1983, which ended last Sept. 30. The actual volume was 15.3 million. Figures for the current year were unavailable at press time.

Last February, the Postal Rate Commission, which is required to issue a nonbinding recommendation concerning all proposed postal rates, rejected the higher charges proposed by the USPS the previous April.

The commission said that the rates should be increased to 52 cents for the first page and 15 cents for the second.

The governors of the USPS rejected this recommendation in May. The Postal Rate Commission then came back with a new one: 49 cents for the first page, 14 cents for the second. Last week, in the course of deciding to torpedo Ecom, the governors also rejected that recommendation.

RACAL VADIC
THE LEADER IN DATA COMMUNICATION DEVICES—
300-4800 BAUD, SYNC/ASYNC, STAND ALONE, RACK MOUNT



CRTs — PRINTERS — DATACOMM — PC's
DSI Digital Source, Inc.
CA So Cal (619) 569-9333, (714) 540-2312, Bay Area (408) 945-1300
Colo (303) 573-5133, Mich (313) 254-4860, Ill (312) 640-7555
D.C. (301) 258-9358, Balt (301) 359-7803, So East (404) 498-2800
NM(505)2945006

PROCMAN
THE
TSO CLIST COMPILER
RELEASE 2.0 NOW AVAILABLE
Release 2.0 Includes:
- SORTED CROSS REFERENCE FACILITY
- CLIST MEASUREMENT FACILITY
- COMPILED vs. NON-COMPILED CLIST TRACE FACILITY
- TSO DYNAMIC STEPLIB ALLOCATION
- TSO DYNAMIC COMPILED CLIST LIBRARY ALLOCATION
- 40% FASTER THAN PRIOR RELEASE

PROCMAN
Continuing to Out-Accelerate the Competition. . .
and There's More on the Way !
Contact The CLIST EXPERTS At:
TONE Software Corp.
1735 S. Brookhurst, Anaheim, CA 92804 (714) 991-9460 Telex 181592

[illegible]

Resourceful because Infodata's [illegible] can be used to create a [illegible] information network—encompassing mainframes and PCs, DP professionals and end users.

Resourceful because applications can be developed quickly and easily with INQUIRE's full-screen [illegible], relational data-base architecture, and easy-to-use fourth-generation language.

Resourceful because text can be fully integrated with numeric data in a single system, thanks to Infodata's unmatched text management software.

Expand your resources with Infodata Find out more about the resources INQUIRE makes available. Come to one of Infodata's free MIS Executive Seminars.

For complete details and registration information, call (800) 336-4939. In Virginia call (703) 578-3430.

Infodata Systems Inc.
5205 Leesburg Pike
Falls Church, Virginia 22041

Resourceful

INFODATA®

The Resourceful Software Technology Company

INQUIRE is a registered trademark of Infodata Systems Inc. © 1984 Infodata Systems Inc.

Uri Geller puts his mind to computers

By John Desmond
CW Staff

Uri Geller, the world's most famous practitioner of psychokinesis, is known for such show business stunts as bending forks and spoons with his mind.

But he has also applied his powers to microelectronics with some surprising results.

Geller's most recent experience with computers occurred last year in Tokyo, where he was taping a television special. The special showed Geller, during two days with Tokai University scientists, trying to erase a tape and trying to halt a Hewlett-Packard Co. graphics system that was displaying continuous aerial images of Tokyo Bay.

Geller

A videotape of the TV special, a copy of which Geller sent to *Computerworld,* shows Geller holding his clenched fist over a hard disk as if trying to physically rip out the stored information. It also shows him standing before the graphics system with two clenched fists raised, deep in concentration.

For four or five hours on the first day, Geller tried to erase the tape and to stop the graphics system's image. "Nothing happened," he said, and he didn't know why.

On the second day, he concentrated for three or four hours and again, nothing happened. Then, giving it one last try, perhaps trying harder than before, Geller shouted, "Stop!" The computer's image "stopped suddenly and never came back," Geller said. The videotape does show the image freezing.

When the Tokai University scientists tried to run the tape again, Geller said, it always stopped at the same point on the tape where Geller had stopped it. The scientist who conducted the experiment was shocked at the results, Geller reported.

Geller's first experience with computers had occurred during experiments at Stanford Research Institute International (SRI International) in 1974, with scientists Russell Targ and Hal Puthoff. In a recent interview, Geller said he was in a room trying to concentrate on bending some metal when he heard an alarm system go off. It turned out tapes on a computer that was located in a sealed basement room were erased. Geller, who was unaware of the computer, said the alarm went off at the precise moment he was upstairs concentrating.

Coincidence? "I believe that my powers caused that to happen. It was the first time I ever discovered that my powers could affect computers."

But Targ said that the experiments at SRI International in 1974 "never confirmed Geller's alleged ability to do psychokinesis in a lab." He attributed the incident to coincidence: "Computers crash all the time."

But Targ and Puthoff did report in the British scientific journal *Nature* that during their experiments with Geller, they observed "certain phenomena for which we have no scientific explanation." (In the SRI experiments, Geller was not allowed to touch metal objects before attempting to bend or break them, as he usually does when he is demonstrating his powers.)

Soviets attempting psychokinesis

The 37-year-old Geller believes psychokinetic ability can be developed in others, and he thinks the Soviets are working on it. "I definitely believe that in the future, there will be people who will be able to do such things — erase tapes from 10,000 miles away."

Or even closer. Geller said it may be more practical for the Soviets to put a group of trained people in a submarine outside territorial waters to try to affect computers on the mainland. He suggested it would take a group of people, not just one.

Asked why he believes such things, Geller said he has heard many rumors from Soviet dissidents now living is Israel, his native country. "Many stories are coming out that the Russians are training people like me," Geller said. He acknowledges that he has chosen the "show business side" of demonstrating his powers and added that he does not really care if people believe him because he may be safer if they don't.

Other than erasing tapes or stopping computers, Geller said he is not sure whether he could affect data processing equipment by changing programming or in other ways. "I do what I am told to do," he said of his experiments. When he was in Tokyo, he was given a floppy disk to erase. He concentrated, "over and over in [his] mind saying 'erase, erase,' " but could not do it.

University research into unexplained occurrences — they call them "engineering anomalies" — does encompass the effect of psychokinesis on microelectronics. One university researcher, who asked not to be identified, said scientists are split into three camps on psychic research — those who think the whole idea is a fraud practiced by magicians; serious scientists who reject such ideas without data to rely on; and serious scientists with a physics background (not only psychologists) who believe the area deserves more investigation.

CRASHES

from page 1

microelectronics of computer chips.

Such research is not usually discussed by academics, who fear being labeled crackpots. But the American Association for the Advancement of Science did vote, in 1969, to accept the Parapsychological Association as a member organization.

Research at Princeton

Dr. Robert Jahn, dean of the Princeton University School of Engineering/Applied Science, suggested in a 1981 paper called "The Persistent Paradox of Psychic Phenomena: An Engineering Perspective" that if it is possible that microelectronic functions could be affected by some mental ability, "it would seem important to obtain some assessment of the potential magnitude of such effects, and of the factors favoring or inhibiting such interference, before much more elaborate integrated-circuit arrays, graphics display systems and other sensitive man-machine interfaces are committed to delicate or critical operations."

Since then, early psychic research at Princeton has concentrated on the design of experiments. The research is said to have both humanistic and practical value. The results could be used to help jinxes, who seem consistently to experience problems with computers and other electronic devices. They could also be used to gauge whether it is possible for an individual to master psychokinesis to such an extent that he could cause computers to malfunction.

Classified research in the U.S. on psychic phenomena, Jahn states in his 1981 paper, is a matter of "considerable speculation on which I cannot comment with authority." However, former President Jimmy Carter is said to have ordered an investigation of Soviet psychic research, according to published reports.

A former Central Intelligence Agency agent maintains that it is foolish to worry about whether someone could will a computer out of operation because the same thing could be done more easily with a manufactured device. "You could just put together a little black box and do it," said William McMahon of Maryland.

Syracuse University's Morris thinks that anyone with psychokinetic power would be using it subconsciously. "Someone with a negative attitude might have a negative effect on something without realizing it," he explained. However, he cautioned that the possible power of mind over matter should not be overestimated: "There is no real evidence from our anecdotes that there are any budding superstars — people who can snap their fingers and make the Pentagon's lights go out."

Morris is now refining his data collection techniques. He is looking for anecdotes from potentially malfunction-linked users. He has distributed questionnaires to students and university computer users and needs anecdotes from users of big systems.

Funding for Morris' research is coming from private backers, many of whom are members of the Parapsychology Association. "Maybe people will open up a little more when it becomes evident they're not weird and not alone," he said.

Anecdotes can be sent to Morris at 313 Link Hall, Syracuse University, Syracuse, N.Y. 13210.

If you're planning to install a computer system or move one, follow the lead of IBM, DEC, Burroughs, Honeywell, Univac, CDC, HP, and the U.S. Bureau of Standards.

Your computer room's electrical environment is crucial to the success of your ADP operation. So if you're an ADP manager, engineer, or site planner, learn "how-to" and "how not to" install computer room wiring at a one-day seminar.

Specific seminar topics include grounding, power isolation and conditioning, life-safety systems, static electricity control, and lightning protection. All seminar material is based on the new "Guidelines on Electrical Power for ADP Installations" published by the National Bureau of Standards, U.S. Department of Commerce.

All seminar attendees will receive a copy of this important document, which describes the Federal Government's and computer industry's recommended guidelines for safe, reliable ADP systems operation. The major computer manufacturers previously mentioned, along with many others, have reviewed its contents and approved them.

Don't pass up this chance to solve your ADP electrical problems *before* they occur.

Seminar Schedule
June 20-Philadelphia
July 18-Chicago
August 14-San Francisco
September 6-New York City
October 18-Boston
November 8-Dallas
December 6-Atlanta

Computer Power Systems Corp./P.O. Box 6240/Carson, CA 90749.
Telephone: (213) 515-6566; ask for Bob Miller.

☐ YES, register me for your ADP Power Seminar in ______ (city)
on ______ (date) My check for $195.00 per person is enclosed.
NAME ______ TITLE ______
COMPANY ______ TELEPHONE ( ) ______
STREET ______ CITY ______ STATE ______ ZIP ______
☐ NO, Don't register me now, but send me more information on electrical power requirements for ADP installations.

COMPUTER POWER SYSTEMS CORP.

Florida legislature lets software tax proposal slide

By David Olmos
CW Staff

TALLAHASSEE, Fla. — Some Florida software companies and users are breathing easier after the state legislature recently failed to approve a bill that would have made custom software subject to the state sales tax.

The proposal would have declared custom software as tangible personal property and, therefore, subject to the state's 5% sales tax.

Florida law distinguishes between two kinds of software. "Customized" software is defined as that created for a particular business and service and modified by programmers. "Canned" software, which is taxed, is defined as standardized, off-the-shelf programs, such as those sold in computer stores.

As part of the state Senate's plan to repeal the state's unitary tax, lawmakers fashioned a replacement tax package, one element of which included the custom software tax. The proposal ran into trouble in the House in the waning hours of the session late last month, however, and the legislature adjourned without acting on the unitary tax.

The software industry has lost recent court decisions in Maryland, Vermont and South Carolina when those states ruled that software could be classified as tangible property subject to a sales tax. California and Michigan are among the states that exempt customized software from sales taxes.

The unitary tax requires multinational and multistate corporations to include their worldwide operations when calculating corporate tax bills.

Many of the state's big businesses, including such giants as IBM and Sony Corp., conducted a vigorous campaign to repeal the unitary tax. When Florida passed the unitary tax last year, IBM said it would limit future expansion at its facility in Boca Raton, Fla., because of the tax.

But software companies that custom-design packages waged their own smaller, but no less energetic, battle against the software sales tax. They contended that the proposal would have meant that small businesses, rather than corporate giants, would pay the cost for repealing the unitary tax.

One of the most vocal opponents of the software sales tax has been Robert M. Sherin, president of Southern Computing Services in Miami. Sherin has crusaded against software sales taxes in several states since 1976.

Sherin contended that lifting the sales tax exemption on customized software would stifle software development in Florida. He has argued that software is an intangible good, much like a lawyer's advice, and should not be taxed.

"It isn't that I feel the software tax can be put off forever," Sherin said, "but I do feel that what's important is that we don't shoulder an unfair burden."

Florida Gov. Bob Graham took no strong stand on the software tax, but did support it as part of the alternative plan approved by the Senate, according to Tom Herndon, director of planning and budget for the state. "We expressed some reservations about it because we were concerned with respect to the economic development import that such a tax would have. But since it was relatively small [estimated to raise $6 million in revenues the first year], we really didn't perceive it as being that critical," Herndon said.

Observers said the custom software tax proposal may be revived if the legislature takes up the unitary tax issue next year.

Boscom lets go 75% of its staff

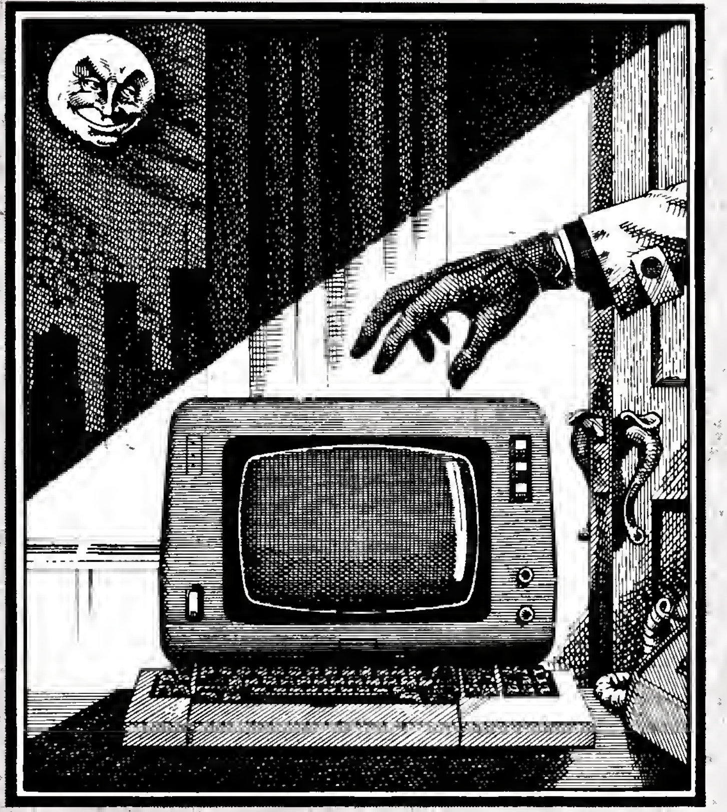
BOSTON — Admitting that its plan was off target, Boscom, the company that is trying to build a permanent computer market center here, laid off more than three quarters of its staff recently to cut costs.

"The leasing of permanent showroom space was not happening as quickly as we had anticipated," Boscom spokeswoman Alice Jelin explained. Codex Corp. signed on two weeks ago, four months later than anticipated. Other Boscom tenants reportedly include IBM, Xerox Corp., Datapoint Corp. and Televideo Systems, Inc.

Among the 34 people laid off were staff members in the program group, which was responsible for attracting audiences to the market center, and people in the systems area, which was coordinating the acquisition and development of the center's computer system. The 11 remaining Boscom employees, including Howard Miller, the company's chief executive officer, will turn their efforts to sales.

Only 28% to 30% of the display space has been committed, whereas the company had hoped to have 50% of the center's space committed by this time. Boscom had originally targeted a late 1984 opening date, but that was pushed back one year to late 1985.

Security in VM
A Different Paradigm



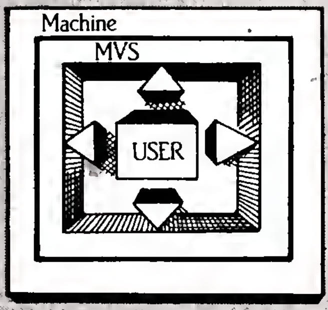
Last night someone accessed the personnel database. Was this for a legitimate business need, or is your VM system wide open? Your computer holds the design plans for the company's hottest new product to be introduced next month. Who has seen, or even copied those plans?

You need security for your system, and for the applications and data it supports. Meeting these security needs requires an entirely different approach in a VM environment than in any other environment.

THE SECURITY ENVIRONMENT
When most people think of security for an IBM mainframe, they have as a mental starting point one of IBM's batch operating systems. Given that DOS has been around since the 60's and MVS since the mid 70's, this is understandable.

So most people have a mindset that links a security system to an *operating system*, rather than a *machine*.

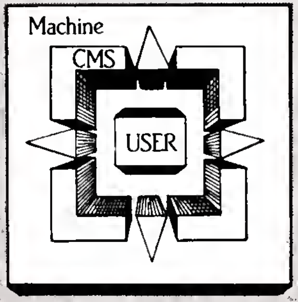
Traditionally, the operating system controls the user:



In fact, in MVS, it controls the user at a *logical* level. It ordinarily allows access only to datasets and other logical entities.

THE VM ENVIRONMENT
Under VM, multiple virtual machines can be run on one real machine. Inside these 'machines', various sets of instructions, or operating systems, can be run. For example, one virtual machine might run CMS, another DOS or MVS. A unique feature of VM is that each virtual machine (or user) is separated by hardware from other virtual machines on the same CPU. Each virtual machine functions independently of the others, making sharing of resources between machines difficult at best.

THE COMPARISON
In contrast to other IBM mainframe environments, such as MVS, the VM control program (CP) allows *physical* access to equipment. Thus, a user can access any logical piece of a physical entity in his virtual machine:



What this means for security is that a user in VM can *bypass* a logical system such as CMS and do physical access in his virtual machine. For example, a user in MVS cannot execute a privileged instruction, such as starting I/O to a device. He must ask MVS to do it. In VM, a user can do it easily.

THE MISCONCEPTION
The main liturgy of the security gurus goes something like this:
We must:
1) Define ownership of all resources (tape, disk, machine access, etc.),
2) Specify rules to access those resources (hence the buzzwords "resource access control"), and
3) Manage and monitor this effort.

This is what you get with a package from IBM such as RACF on MVS.

One might conveniently think that the low level commands from such an MVS security implementation could be 'moved' to VM, but this is a dangerous misconception.

Any security facility implemented in an operating system within VM, such as CMS, whose usage can be bypassed, is just smoke—not realistic at all. Think of a security system that modifies every possible CMS command to control logical access to files. Sounds good, but any programmer can write a program *outside* CMS to beat it, or copy an unaltered version of a command from one of 10,000 plus other VM systems.

The virtual machine is the only level at which a VM system can be secured.

THE SOLUTION
First, what does VM itself offer for security? The VM directory defines users (virtual machines) and maps virtual to physical resources for those users. It contains a password for each user to access the system, and an optional password for access to each user's disk by others. In fact, VM is relatively secure when users need not share. The simple reality though, is that programs and data must be shared among users.

To be effective, a security package must work within the constraints of, and address the vulnerabilities of VM. It must be implemented at the control program level of VM—where it cannot be bypassed in CMS. It must be built within the VM directory scheme, so that it becomes an integral part of the VM system, and it must not require modifications to any part of VM or CMS.

The issue of security in the VM environment cannot be approached in the same way as for batch operating systems. It requires a vendor who understands the intricacies of VM to develop a security package to meet the needs of the VM community. It requires a vendor with the creativity to implement a system that addresses the unique features of VM.

VM Software Inc. is the undisputed leader among vendors of system software for the VM environment. Our newest product, VMSECURE, was designed by our experienced staff of VM professionals. VMSECURE is a resource access control, directory management, and disk space management system designed specifically to address the security needs of VM users.

VM Software Inc.
2070 Chain Bridge Rd.
Suite 355
Vienna, Virginia 22180
(703) 821-6886
1-CWX-0684

GM tells how robot became team player

CW AT ROBOTS 8

By Edward Warner
CW Staff

DETROIT — General Motors Corp.'s Fisher Body Division has taken the major step in the transformation of the robot from a stand-alone worker to a team player in a total systems approach to factory automation.

Speaking last week at the Robots 8 Conference here, Frank DiPietro, the division's director, said Fisher has begun grouping robots in assembly cells responsible for an entire step in the manufacturing process. The division's first such cell, at its Livonia, Mich., plant, fits trim and sound-deadening materials to doors for GM's Oldsmobile C cars and Buick models.

The nine-station assembly line, run entirely by robots and vision scanning systems working side by side, is notable for its flexibility, DiPietro said. The assembly cell can produce doors with 12 different interior trim styles and can be reprogrammed to do door trim assembly for the automaker's other models as well. It requires half the floor space of a system using people.

"Classic Detroit-style automation lacked flexibility and convertibility," DiPietro said, defining convertibility as the ability to switch product lines with little retooling. "We're changing all that."

The creation of assembly cells represents what DiPietro called Fisher Body's "transitional approach" to systematized factory automation. GM has 3,000 robots in use or on order, and 5,000 robots are expected to be working for the firm by 1985.

One of the key features of the door trim assembly cell, DiPietro noted, is the integration of its vision scanning systems (two vision stations are used) with the work of the cell's robots.

At one point in the assembly process, a vision system scans the door panel to determine the exact location of its stud holes. The robot at the next station in line then "installs the fasteners in real-time to the precise location [found] by the vision system," he said.

The automaker is moving toward a systems approach to manufacturing automation because of its flexibility and cost-effectiveness and the improvements it can bring in the quality of work and in the quality of the cars produced, DiPietro said.

CW photo by E. Warner

George Paul (left) of Macro Photo Service watches a small robot make plastic grippers while John Holdman of Microbot looks on at Robots 8.

Workers can accept robots

DETROIT — Gaining the cooperation of workers is an important and often overlooked step in the process of implementing robotics. Without the cooperation of the machine's coworkers, the implementation could be doomed.

So said Vincent M. Altamuro, president of Robotics Research of Toms River, N.J., who spoke here last week during a seminar at the Robots 8 Conference. Worker acceptance is needed, Altamuro explained, because the robot is not just another machine; it can do a job a person would ordinarily perform.

Altamuro pointed to the recent destruction of a computer system by a group of hammer-wielding opponents of automation in West Germany. While robots have not yet suffered such a fate, he said, workers have often passively resisted robot installations and "caused them not to work."

To get workers on the robot's side, managers should provide the workers with training or retraining and keep them informed of the implemention's progress. Managers outside the implementation team should be won over, too, he advised, adding that the toughest people to convince to accept the robot are middle management.

Admitting that little research exists on what implementation programs seem to work, Altamuro gave his audience of about 100 engineers and executives some rules for introducing a robot:

■ Make sure the first application is legitimate and justifiable.

■ Develop a technically sound engineering design.

■ Have a clear, complete operation introduction schedule.

Anything our advanced Exxon workstations can do...

The EXXON 500 Information Processor.

Every day, more companies are shocked to find that their compatible workstations and printers can't get the most from each other.

A shockproof team

That's why the people at Exxon Office Systems offer products designed to be part of an integrated system — including workstations and printers that are made for each other. We call this shockproof team the Exxon Business Support System.

The Professional Duo

Our Business Support System improves communication throughout your office, since the EXXON 750 Professional Workstation is designed to work with the EXXON 500 Series Information Processor.

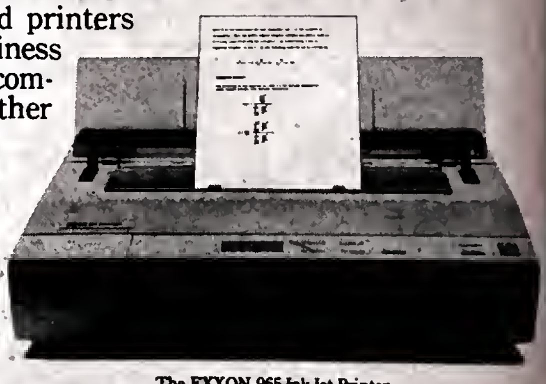
It's the ideal duo for a manager and an assistant, because it lets them share and transfer information easily through completely compatible disks.

A complementary combination

Best of all, the incredibly quiet EXXON 965 Ink Jet Printer complements both workstations. It prints out business graphics, spread sheets, and integrated documents produced on the new EXXON 750. And the mathematical scientific, and oversized characters produced on the EXXON 500 can be printed out on the EXXON 965 as well.

That's how the Exxon workstations and printers in the Exxon Business Support System complement each other — and you.

The EXXON 750 Professional Workstation.



The EXXON 965 Ink Jet Printer.

For more information

Call 800-327-6666, or write Exxon Office Systems,
P.O. Box 10184,
Stamford, CT 06904-2184.

We'll be happy to demonstrate how Exxon workstations and printers bring you the future ... without the shock.

Attendees blunt about reason for installing robots

CW AT ROBOTS 8

By Edward Warner
CW Staff

DETROIT — The best reason for acquiring a manufacturing robot is also the most obvious: reducing labor costs, according to several executives and engineers interviewed at Robots 8, a trade show and conference on robotics held here last week.

Jerry Day, senior equipment development technician for Beatrice Eckrich in Fort Wayne, Ind., may have put the feelings of those interviewed most bluntly when he explained why he was scouting the trade show for robots that might have applications in his firm's meat packing operation.

"The idea," Day said, "is to get rid of labor."

Production bonuses

Tom Lyden, a principal staff engineer for Motorola, Inc., agreed that the big reason is labor savings, but added that a system of production bonuses in use by his firm makes robots attractive to those workers who are not displaced. "As things get more efficient," he explained, "people get paid more."

Robert Boardway, a systems specialist with the Ford Motor Co., also cited labor cost justification as the key issue. "We have to replace enough people to pay for the robot," he said. But robots are being phased in slowly by the automaker, mostly at new facilities to avoid extensive layoffs, he added. Boardway could not say how many former Ford workers have been displaced because of robots nor the number of robots in use by the firm.

No one was laid off at Core Industries, Inc., in Bloomfield Hills, Mich., however, when it began using robots in the assembly of a part for one of its electronics testers. According to Matthew Marko, an industrial engineer with the electronics firm, the labor savings and other efficiencies the robot brought gave a 50% reduction in costs to that part's assembly.

But a different perspective on labor cost savings derived from robots was given by Vern E. Estes, manager of robotics applications consulting and business development for General Electric Co. in Orlando, Fla. Pointing to the potential for robots to cut workmen's compensation costs by removing workers from dangerous tasks, Estes said, "When you're looking for potential robot applications, see the company nurse."

PRICES from page 1

Prices have also been slashed on several other microcomputer programs in recent weeks, including the Vision series from Visicorp of San Jose, Calif., and the Leading Edge word processing package offered by Leading Edge Products, Inc. of Norwood, Mass. However, these packages have not been setting the market on fire and are not expected to affect pricing throughout the industry, experts said.

The same holds true for IBM's announcement of the Assistant series of low-cost software programs [CW, May 28]. "IBM's very interested in capturing software sales, but it hasn't been very successful," said Paul Jenusaitis, sales vice-president of Computerland of Connecticut in Wallingford, Conn.

Because both vendors and dealers naturally want to keep micro software prices as high as the market will bear, vendors that cut software prices are meeting strong resistance from dealers that want to maintain their sales margins, analysts said.

This high-price strategy is possible because business customers buying personal computer software "are not particularly price-sensitive and never have been," said Jeff Raikes, manager of applications marketing at Microsoft, Inc. in Bellevue, Wash.

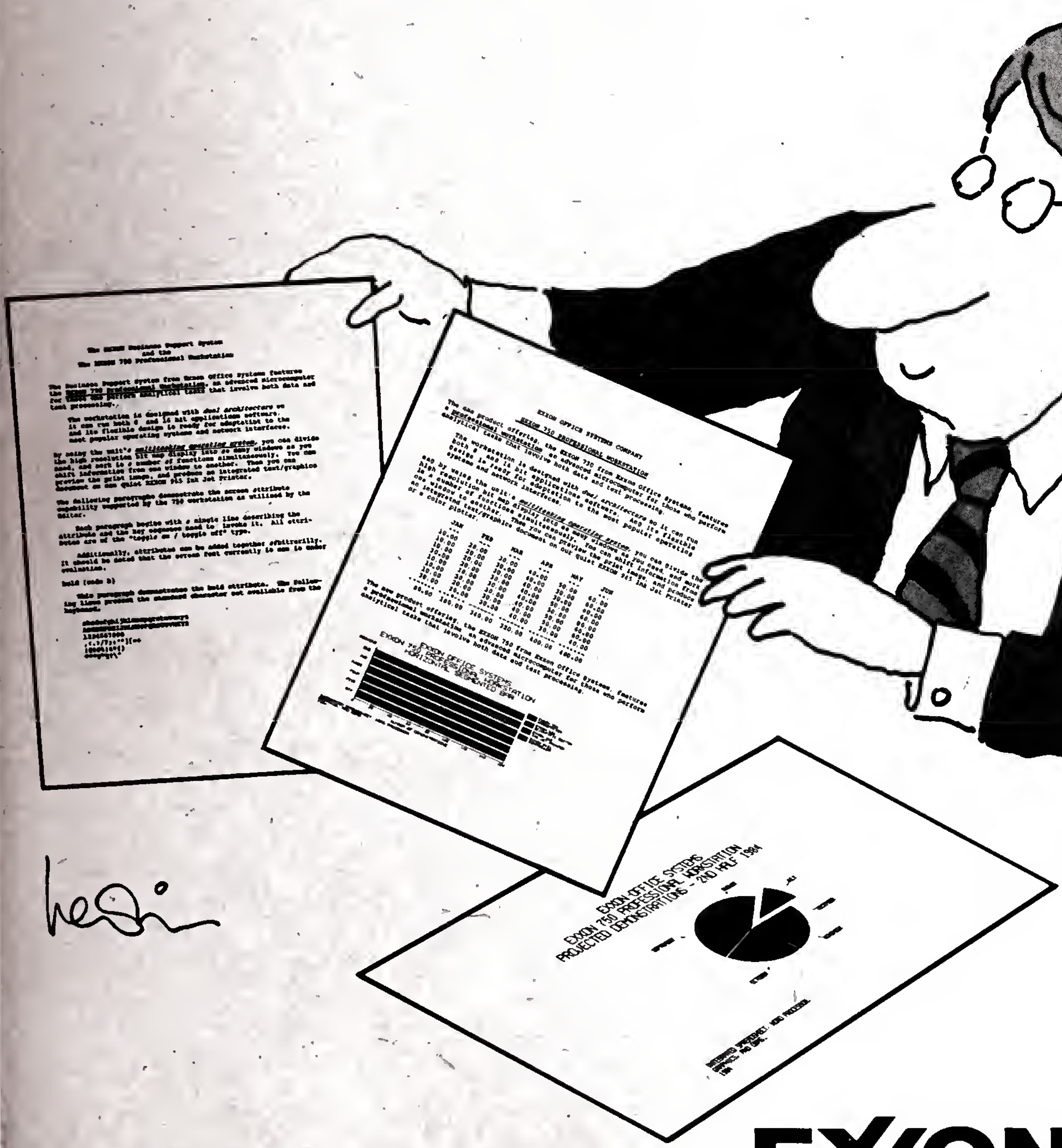
For Fortune 1,000 customers in particular, price is not a primary consideration, said Wilton Jones, president of Multimate International Corp. in East Hartford, Conn. "It's definitely not that significant."

Jones predicted increased price competition. Six months ago, he observed, his firm could have introduced a simpler, less capable version of its word processing package for $350, but such products must now be launched at under $250. For top-of-the-line packages, however, "the basic bottom line is to keep adding features and keep the price."

Larry Smart, general manager of Peachtree Software, Inc. in Atlanta, agreed that "list prices will remain pretty much the same; we'll see enhancements to the product." Smart noted that prices for Peachtree's accounting packages haven't changed during the past two years.

Both start-up companies and small players will continue to price their products very aggressively, executives said. In addition, street prices for some packages will drop as competition among distributors and dealers increases. The people who can't keep up will cut prices, Smart said.

our incredible Ink Jet Printer can print.


EXXON OFFICE SYSTEMS
EXXON 750 PROFESSIONAL WORKSTATION
HORIZONTAL SEGMENTED BAR
EXXON OFFICE SYSTEMS
EXXON 750 PROFESSIONAL WORKSTATION
PROJECTED DEMONSTRATIONS - 2ND HALF 1984

EXXON OFFICE SYSTEMS
The future...without the shock.

Merchandising systems seen revolutionizing retail mart

CW AT NRMA

By Robert Batt
CW West Coast Bureau

LOS ANGELES — The widespread acceptance of automated merchandising systems and the dramatic increase in the number of specialized software packages are changing the face of the retail industry.

This was the message delivered to attendees at the National Retail Merchants Association (NRMA) Midyear Conference and Equipment Exposition by Robert Zimmerman, director of retail industry services at the New York-based certified public accounting firm of Coopers & Lybrand.

Zimmerman said it is only now that the true impact of developments in technology is hitting the retail industry.

A retailing revolution

"Traditionally, retailers have sold their products by emphasizing their differences with their competitors. Therefore, for off-the-shelf software packages to be acceptable to retailers is revolutionary," Zimmerman claimed.

In part, he noted, this change of heart can be traced to business and cost pressures. Software packages are now seen as less risky and less expensive than in-house applications.

"There is now a growing recognition that many of the information processing functions are common to retailers. As a result of software packages, retail companies will see a major boost in their productivity over the next five years," he predicted.

Substantial effort

"Successful implementation of most packages requires substantial effort before, during and after installation," Zimmerman said. "Packages cannot be considered plug-in solutions, and selection must be based on complete information."

The starting point for package selection is within one's own company, Zimmerman told his audience. Users must identify their business requirements, establish conceptual solutions and understand the expected benefits.

Certain critical questions need to be asked, he suggested, including:

- How well does the package fit the user's operating system, telecommunications and data base software?
- Does the package have the growth and flexibility needed to fit the user's business, including maximum volumes, number of stores, departments, classifications and so on?
- What modifications will be necessary, and who will do them?

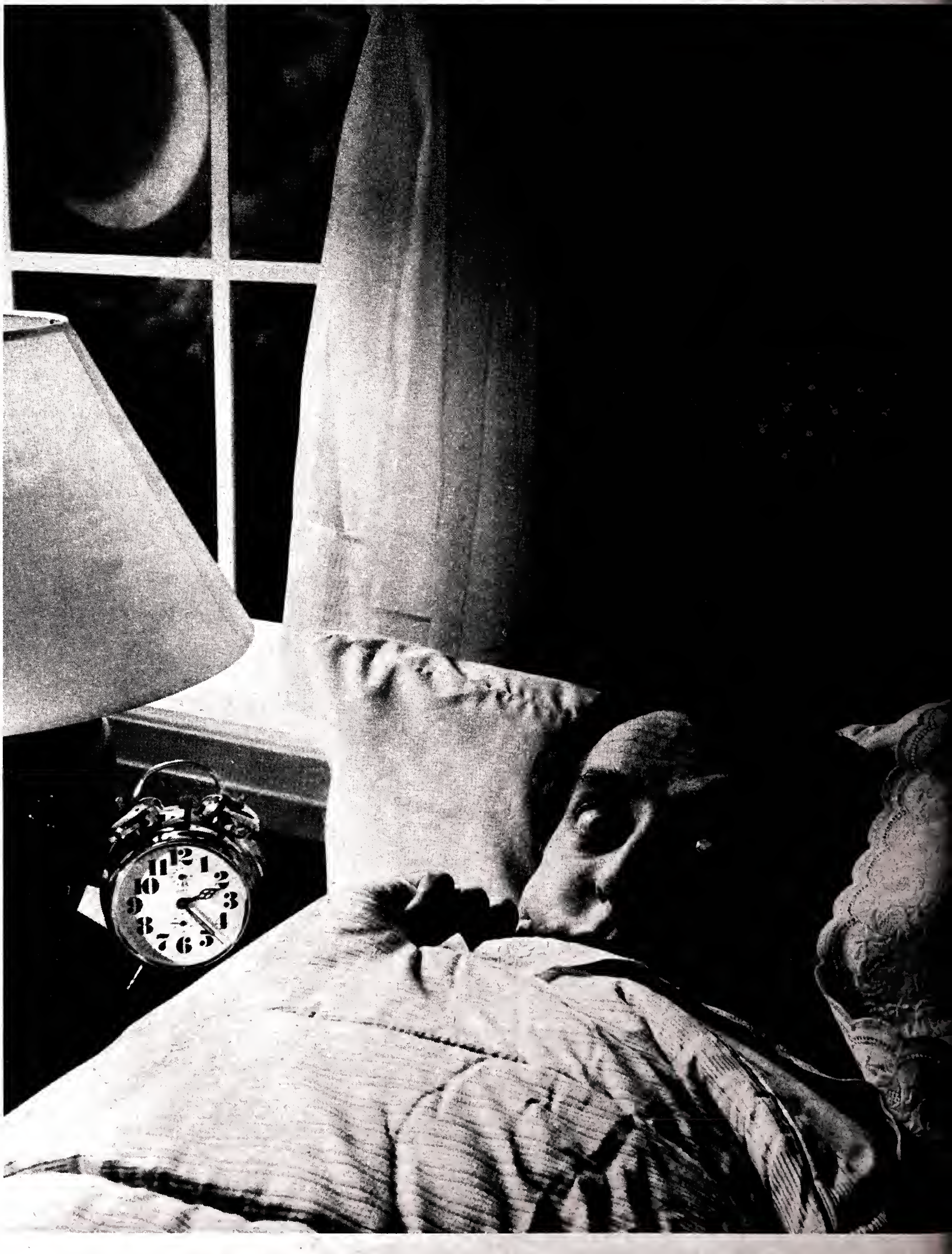
The selection process for automated retail systems was also highlighted by another conference speaker, who stressed the need to involve senior management in the process.

Management commitment

Warren Reid, director of management and information systems consulting at Laventhol & Horwarth, a professional services firm, said, "If senior management doesn't demonstrate its commitment, the chances of successfully installing a new automated system are small."

Delivery of a new hardware system for retailing should only be accepted by users after the software has been thoroughly tested in-house and after management has reviewed the results, he added.

In selecting a system, Reid concluded, retail users should establish their goals and priorities as well as their present and future needs. They should then document their requirements and identify which of them are mandatory, which are merely desirable and which are optional.



Micros seen altering nature of MIS in retail industry

CW AT NRMA

By Robert Batt
CW West Coast Bureau

LOS ANGELES — The proliferation of microcomputer use throughout the retailing industry has dramatically changed the nature of the MIS function within this industry, a retailing consultant said.

In an interview at last week's National Retail Merchants Association (NRMA) Midyear Conference and Equipment Exposition here, Al McCready, national director of retail consulting at Arthur Young & Co., said retail companies have traditionally lagged behind most parts of corporate America in terms of their expectations of MIS. This situation, he added, is rapidly changing.

In a wide-ranging discussion of data processing issues in the retail industry, McCready said the most effective MIS managers will be those who are able to recognize the importance of three major factors and find a balance among them. These factors include:

- The development of the in-store or point-of-sale (POS) system as a highly intelligent node within the MIS network of computers.
- The need by computer users for integrated retail systems. "It will be the fault of the MIS department if, in the next recession, retail companies are not able to effectively manage their inventory because their systems are not integrated," he warned.
- The emergence of a single flow of data throughout a retail organization.

On this last point, McCready claimed most retail companies have fragmented their flow of information so that duplicate data is produced by different departments.

"In the new environment which needs to come into being, this situation must be rectified," he stressed.

McCready likened the transition from multiple data flows to a single one to the transition that had to be made by companies when developing common data bases. Such a transition will not be easy, he cautioned.

"When you throw data from intelligent in-store systems and micros into a single information flow, it takes on a very frightening aspect for the MIS manager.

"This is because it is very difficult to manage such a flow in companies with thousands of outlets and a myriad of information channels and still be able to put the data into a coherent set," he explained.

The changing role of MIS managers in the retail industry was also emphasized at the conference by James Gray, executive vice-president for Bullock's Department Store.

In an interview at the conference, Gray said future technological developments will lead to direct computer links between retail companies and their vendors.

"To take advantage of what is possible, the MIS manager must have enough vision to enable him to change things. He must be able to adequately present the advantages of integrated technology to his senior management," he commented.

This, Gray stressed, will require the MIS director to be less of a technician concerned with bits and bytes and more of a businessman.

Future technological developments in retailing were also addressed at the NRMA conference by Randy Allen, director of national retail consulting service at Touche Ross & Co.

In a conference speech, Allen said store information systems are the future with the emergence of customer-activated terminals, specialized terminals such as videotext machines and general purpose POS units.

THE NEW BURROUGHS B25.
IT WILL ELIMINATE THE REASON
4 MILLION PEOPLE
AREN'T BUYING COMPUTERS.

Most business people are frightened at the prospect of choosing a small business computer.

The sad truth is, choosing wrong could mean getting stuck with an obsolete system in a very short time. One that can't grow when your business grows.

That's why Burroughs developed the remarkable B25—a new kind of micro computer that keeps growing long after other computers have to be replaced.

Its modular design allows you to add memory and storage when you need it. Simply by snapping on modules.

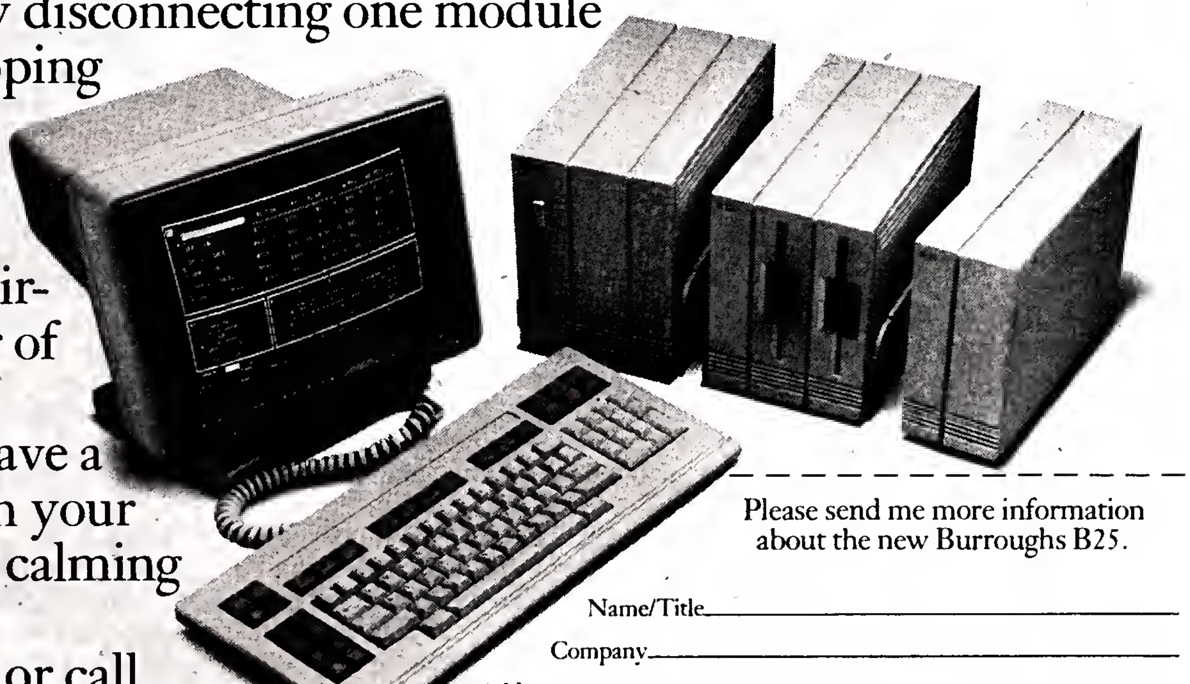
And you can build a B25 network just by adding workstations. It's the only network designed to share data simultaneously. So entire departments can plug into the same data bank.

Needless to say, the B25 is backed by Burroughs' worldwide service and support. Plus, its self-diagnostic software can actually show you where a problem is occurring. So most of the time, fixes can be made quickly by disconnecting one module and simply snapping on another.

The new Burroughs B25 has eliminated virtually every fear of obsolescence. Which should have a positive effect on your business. And a calming effect on you.

Mail coupon or call toll free: **1-800-621-2020.**

Burroughs
THE QUESTION ISN'T WHO'S BIGGER.
IT'S WHO'S BETTER.



Please send me more information
about the new Burroughs B25.

Name/Title__________
Company__________
Address__________
City__________ State__________ Zip__________
Telephone__________

Send to: Burroughs Corporation, Dept. B25,
P.O. Box 10934, Chicago, Ill. 60610

CW6-11

© 1984 BURROUGHS CORPORATION

TECHNOLOGY SPOTLIGHT

Services tuning in on wireless transmission methods

By Phil Hirsch
CW Washington Bureau

IBM and Merrill Lynch & Co. plan to launch an unusual on-line information service next year. Using the Public Broadcasting Service (PBS) television stations and low-cost, receive-only satellite dishes two feet in diameter, they intend to distribute financial information to personal computer owners across the nation.

Initially, the audience for this wireless transmission service will consist of Merrill Lynch account executives, but International Marketnet, the partnership established by IBM and Merrill Lynch to market the new service, will later offer it to other brokerage firms, the brokerage firms' clients and the general public.

The proposed IBM-Merrill Lynch service represents one of several emerging uses of radio, microwave and television channels to transmit data. These innovations have been triggered partly by technology — specifically the increasing sophistication and declining price of integrated circuitry — and partly by the rapidly growing use of computers and computerized devices in the home and office.

Unusual features

What makes the IBM-Merrill Lynch service unusual is that it will use spread spectrum transmission and television's vertical blanking interval. A spread spectrum system breaks up a message into multiple portions and broadcasts each over a different frequency. The frequency sequence is known to the receiver, but no one else, thus providing security. Improved frequency utilization and a reduction in interference are the other benefits.

The vertical blanking interval is the space between the frames of a commercial or public television program. It can carry six data channels, each operating at 9,600 bit/sec, and deliver information to anyone with a television set.

While some of the new transmission services use public and commercial television channels, others employ the considerable band of television frequencies allocated by the Federal Communications Commission to private users. For example, Reuters, the international news service, will deliver on-line information services to home and business users via the planned Private Operational Fixed Microwave Service.

Pay television programs

Microband Corp., a subsidiary of Tymshare, Inc. and a vendor of on-line services, plans to begin delivering pay television programs over Instructional Television Fixed Service (ITFS) channels later this year in New York, Washington, D.C., San Francisco and Milwaukee; several more cities are scheduled to follow.

A number of the recently developed services utilize portable terminals. One example is the "pocket computer" that Motorola, Inc. developed for IBM. Officially known as the PCX Portable Radio Data Terminal, it will enable IBM service technicians at customer sites to communicate on a two-way basis with IBM terminals and computers anywhere in the country. The technician will be able to order parts, check customer service records, obtain his next assignment and send in customer service reports through the new terminal. Motorola claims these capabilities are only a small portion of the information that the device can handle.

Another company, Millicom, Inc. of New York, offers a digital paging service in New York, San Francisco, Los Angeles and San Diego. The service delivers messages to a pocket-sized receiver, the Metagram, which displays 24 alphanumeric characters. It also stores up to 1,550 characters, or about six typewritten pages, which can be scrolled across the display screen. Millicom will soon add a plug-in connection to the Metagram receiver, providing connection to a low-cost, hard-copy printer.

Meanwhile, AT&T Technologies, Inc., the successor to Western Electric, plans to unveil a data communications terminal "by the end of this year or early next year," according to Mark Nelson, product manager of cellular telecommunications systems for AT&T Technologies. The terminal will be able to connect to the cellular radio system the company has already developed. Known as the Advanced Mobile Phone Service (Amps), the cellular radio system is operational now in Chicago and Washington, D.C.

FCC eases restrictions, spurs interest in radio transmission

Interest in data transmission systems based on the use of radio frequencies has been generated partly by a series of Federal Communications Commission decisions eliminating restrictions on their use.

In one key decision made last year, the FCC authorized the nation's commercial and public FM radio stations to use or lease their subcarrier channels for nonbroadcast applications, such as point-to-point data transmission. The FCC simultaneously broadened the FM baseband, thereby increasing the number of subcarrier channels available to each station, and said they could be used even when the station's main channel is not in use.

Currently, there are about 4,500 commercial and noncommercial FM stations in the U.S.

Operators of mobile telephone systems, who see the FCC decision as a competitive threat, and state public utilities regulators, who resent the commission's assumption of federal hegemony over what they consider intrastate communications, have asked the U.S. Court of Appeals in Washington, D.C., to review the decision. But this has not prevented a number of companies from devising new services based on FM subcarriers.

One example is Quotrek, an online stock/commodity quotation service put out by Dataspeed, Inc. and offered in San Francisco, Los Angeles, Chicago, New York and Dallas. Quotrek uses a pocket-sized radio receiver weighing 11 oz. The subscriber, by depressing a few keys on the face of the terminal, selects up to 40 securities from a list of 7,000 traded on the New York, American and other major stock exchanges.

The Quotrek network, which consists essentially of a computer center in San Mateo, Calif., with satellite channels connecting it to local FM stations and FM subcarrier channels, broadcasts the quotations on all 7,000 stocks, and each subscriber's receiver captures the designated group, of up to 40, as the information is transmitted through the ether.

The receiver, which looks like a pocket calculator, has a four-line, 40-character display screen and can store up to 1,550 characters, according to James F. West, president of Dataspeed, which also developed the terminal.

Washington, D.C., and Houston will soon be added to the list of cities where Quotrek is offered.

In August, Dataspeed plans to unveil what it termed a modio — a radio modem able to interface with personal computers and printers, plus a planned portable terminal "about the size of an attache case," both connectable to an FM subcarrier channel, West said. This device will support Dataspeed's Informa, an electronic message/mail network that also will provide news and other information services.

Digital paging service boasts greater reliability, less delay

Millicom, Inc.'s Metagram, like other wireless transmission services, uses a pocket-sized receiver, but the application — digital paging — is more general.

New York-based Millicom is now constructing radio networks in a number of U.S. and foreign locations, including Hong Kong and Canton, China. The Metagram digital paging network, on the air since January, now operates in four U.S. cities and will be available in several more within the next few months.

The big advantages of digital paging over its predecessors, according to Millicom's service manager, Sanford Jewett, are greater reliability and less transmission delay. Paging systems that transmit voice messages, he pointed out, are often difficult to hear because of transmission or ambient noise, and the receiver cannot store the message.

Digital systems not only have memory, but because the signal is binary, includes an elaborate error-detection/correction scheme and is read rather than listened to, the service is less likely to degrade, Jewett said.

He also said that text can be transmitted in binary form faster than it can be spoken, so digital paging has an economic advantage over the telephone as well, particularly in a period when rates are going up.

Jewett admitted that Metagram, like other paging services, suffers from the fact that it's a one-way-only service. But even so, he contended, "one-way could replace two-way in certain situations. Communications between a company employee and a subcontractor or vendor are often one-way in nature, and if relationships are well-established, there is little need for the personal touch."

Paging has a unique advantage, especially when the message has to be delivered in a hurry and the recipient is hard to reach, Jewett noted: Unlike telephone service, it's usually able to deliver the message the first time.

The Metagram network consists essentially of computers connected, on one side, to dial-up and leased telephones that receive messages from senders and, on the other side, to radio transmitters that deliver the messages to subscribers equipped with pocket receivers. The terminal has a one-line, 24-character display; it stores up to 1,550 characters that the user can scroll across his screen.

All transmitted messages are stored within the network in case they get lost on the way to the subscriber's receiving terminal. Moreover, the messages are numbered, which helps the recipient know whether or not he received one. The receiver has built-in circuitry that tells a subscriber whether he is in or out of range of the radio signal.

ANTICIPATED WIRELESS TRANSMISSION SYSTEMS AND SERVICES

URBANET

Developed by Microband Corp. and scheduled to begin operation in four cities by the end of this year, Urbanet will use leased microwave channels to distribute pay TV programs.

The company plans to add a return loop next year. Through codes punched into his Touch-Tone telephone, the user will be able to order TV programs automatically on a pay/view basis; later, Microband said, he'll also be able to order personal computer software, theater tickets and video games. They will all be delivered as well as ordered on-line.

INTERNATIONAL MARKETNET

A joint venture of IBM and Merrill Lynch & Co., International Marketnet will transmit financial news to owners of IBM Personal Computers via the vertical blanking interval (VBI) of public TV stations and via satellite using spread spectrum transmission.

SILENT RADIO

Developed by Cybernetic Data Products, Inc. of Chatsworth, Calif., this system will use VBI to deliver text/graphics advertising to electronic display boards located in shopping malls and other public areas within Los Angeles.

The decoder connecting the VBI channel to the display board's processor can, with "virtually no modification," link the channel to a personal computer, according to Cybernetic Vice-President Richard Gingras. The company plans to deploy such a network if, as expected, the Federal Communications Commission allows the VBI to be used for data transmission.

Speeds of up to 9,600 bit/sec are feasible, and use of a packetized format would permit channel sharing. Cybernetic plans to lease VBI capacity, plus its decoder, to users.

Typical applications: downloading computer software and transmitting price changes from a chain supermarket's headquarters to branch locations.

POCKET COMPUTER

This is a pocket-size radio terminal, with extensive message-handling capability, built by Motorola, Inc. for IBM field-service technicians. The technician will be able to retrieve as well as update customer service information stored in remote IBM data bases.

Motorola is now seeking other applications for the terminal.

METAGRAM

A one-way paging system, Metagram features a 5.6-oz, pocket-size terminal that can display 24 characters at a time and store 1,550 — more than six pages — which can be scrolled across the screen. A plug-in connection permits connection to a hard-copy printer or personal computer.

Metagram will be "the first operational nationwide electronic message service," according to its vendor, Millicom, Inc. of New York. It is now available in four cities.

QUOTREK

A stock quotation service that uses FM subcarrier channels, Quotrek features an 11-oz, pocket-size terminal that the user programs to capture data on up to 40 stocks and/or commodities. The terminal has a four-line, 40-char. display.

Dataspeed, Inc. of San Mateo, Calif., which developed the terminal and offers the service, is planning a subcarrier-channel-based financial quote service for personal computer owners. Within a year to 18 months, it hopes to provide airline schedules, sports results, news stories and other types of text information via FM subcarrier to an attache-size portable terminal having an 80-char. display.

AUTOPLEX DATA TERMINAL

AT&T Technologies, successor to Western Electric, is working on a data terminal that can communicate through the cellular mobile radio networks now being installed in cities across the country.

The company hopes to have a commercial version ready to market by "early next year," a spokesman said.

FCC asks public comment on VBI use as firms gear up to transmit

"Because there is a growing demand for additional data transmission services, we propose to authorize both commercial and public television stations to offer these services on the [vertical blinking interval]."

That statement, released in March by the Federal Communications Commission, was part of a "notice of inquiry" seeking public comment on whether to let the vertical blinking interval (VBI) be used for data transmission services. The commission said it was particularly interested in receiving comments on how the VBI might support paging services, pointing out that earlier studies indicated there would be about 3 million pagers in use by next year and that the number of channels allocated to paging services, even though increased in recent years, might not be enough.

Among the respondents to the FCC's notice was Cybernetic Data Products, Inc., a Los Angeles company that recently began using the VBI to deliver teletext-based text/graphics messages to moving-message electronic display boards in shopping malls, transportation terminals and similar locations in Los Angeles. This "silent radio," which is now being expanded to other cities, uses a decoder that can be connected "with virtually no modification" to personal computers, said Vice-President Richard Gingras.

Cybernetic is now exploring the possibility of leasing VBI capacity from TV stations and reselling it to end users along with the company's decoder. Downloading software to personal computer users is one possibility. Another option is leasing the VBI as private-line substitutes.

Although the VBI transmits only in one direction and at present can handle only relatively low speeds — 9,600 bit/sec is probably the practical limit, Gingras said — use of a packet protocol allows each channel to be carved up into multiple virtual circuits and shared by a number of users. Also, Gingras pointed out, technological improvements undoubtedly will increase the data rate in years to come.

IBM and Merrill Lynch & Co. are also planning to exploit the VBI. They recently formed a joint venture company called International Marketnet to distribute financial news to owners of IBM Personal Computers and 3270 Personal Computers. Initial customers will be Merrill Lynch account executives. There are some 10,000 of these, assigned to some 500 offices around the country.

International Marketnet will broadcast from New York via satellite using a new technique called spread spectrum transmission. In some cases, the signal will be received by public TV stations and then retransmitted over their VBI channels to the user. In other cases, the signal will be transmitted via satellite directly to a small-diameter dish antenna on the user's rooftop or in his parking lot. According to Jerry Higgins, a Merrill Lynch vice-president who is one of the system's architects, the receiving antenna will cost $2,500.

OFS rule changes target increase in transmission applications

In addition to commercial TV, the Federal Communications Commission has also set aside TV channels for business and institutional use, and within the past few years, has changed the rules of its Private Operational Fixed Service (OFS) to encourage data transmission applications.

The major change consists of reserving three channels within the 2.5-GHz band until Aug. 1, 1985 for point-to-multipoint uses other than video entertainment. Delivery of computerized information to end users was among the applications specifically authorized by the FCC.

According to an FCC spokesman, more than 2,000 transmission applications have been filed, and 30 to 50 have been granted. One of the winners was Reuters Ltd., which plans to deliver its financial news service via OFS channels in a number of cities.

Meanwhile, Vianet, Inc., headquartered in San Diego, has been awarded OFS channels in Tulsa, Okla.; Denver; Kansas City, Mo.; and San Antonio. This fall the company plans to begin downloading software to personal computer users. Each program will self-destruct after it has been used once, but the price will be "very low," a Vianet spokesman said.

Vianet's main business is Multipoint Distribution Service (MDS). It distributes TV programs over the air, mostly to viewers located beyond the reach of cable networks.

The nation's largest MDS carrier, Microband Corp. of New York, also has developed an on-line information delivery system. Called Urbanet, it uses the Instructional Television Fixed Service (ITFS), which are microwave channels licensed to schools for closed-circuit TV and similar uses. Under an FCC decision issued last year, the schools can now lease their ITFS channels to others for noneducational uses, such as data transmission.

Although many of the new TV-based data transmission services are directed at residential users, the growing use of personal computers within companies seems likely to make the business user an attractive prospect. ITFS and OFS channels are also capable of transmitting data at very high speeds, which will make them increasingly attractive as the costs of telephone-company-provided facilities go up.

The big drawback of ITFS and OFS channels at present is that, with certain exceptions, they can transmit in only one direction. But this situation may change. MDS carriers have won FCC permission to provide limited two-way service, and it is likely that further efforts will be made to interconnect OFS/ITFS facilities with other networks to provide a return loop.

For applications requiring higher data rates, it is possible that OFS or ITFS channels will be linked to digital termination systems, which can operate at speeds up to 1.5M bit/sec.

Codex, Massachusetts settle Prowse Farm dispute

By David Olmos
CW Staff

CANTON, Mass. — Codex Corp. will be allowed to complete its $20 million world headquarters on historic farmland here, after all. But the company will have to abide by tough environmental and employment restrictions imposed by the state.

In a decision that sought to appease both environmental and business interests, Massachusetts Gov. Michael S. Dukakis last week approved a compromise plan that will permit the data communications firm to build on the 55-acre site known as the Prowse Farm.

It had appeared that Codex would be forced to abandon the site after the Massachusetts Supreme Judicial Court last month ruled that the state Metropolitan District Commission had the authority to take the property by eminent domain. Codex responded by strongly hinting that it would make no future investments in Massachusetts and would move its headquarters and nearly 2,000 jobs to another state [CW, June 4].

Faced with mounting pressure from state legislators who supported Codex, Dukakis decided to allow the state to seize the land by eminent domain, but to grant Codex an easement to finish construction. "The governor gave [both sides] the only reasonable solution to an unfortunate situation," commented Rick Gureghian, deputy press secretary in the governor's office.

Some environmentalists, who had sought to preserve the scenic area for recreational use, chastised Dukakis for bowing to business interests.

"The case was a test of steel, and clearly Codex's steel was stronger than ours," according to state Sen. Joseph F. Timilty (D-Canton), who opposed the Codex site. The farm, located in this town about 15 miles south of Boston, is one of the few remaining large open spaces in the metropolitan area.

Under the accord, Codex agreed to locate all its future Massachusetts manufacturing jobs in Bristol County, an economically depressed area in southeastern Massachusetts. The Motorola, Inc. subsidiary now employs some 1,700 people in Mansfield in Bristol County. The company said it will initially employ an additional 500 people at the Canton site, adding 500 more in several years.

Other restrictions include confining construction to 11 acres, leaving 44 acres for farm use; restricting the the building to its planned size; limiting the number and location of parking spaces; and allowing public access to the farm for visits by schoolchildren.

What do top computer professionals usually say when we tell them about our unique, completely portable software?

"NO WAY!"

And actually we are not surprised. After all it took us 5 years to figure out how to do it. And now that we've gotten over that hurdle our biggest problem has been convincing people that Tominy's* completely portable application development system really works.

Tominy allows you to develop completely portable application programs which can be used without modification on micros as well as mainframes and everything in between. That means no more costly and unproductive time spent in developing special systems to fit individual computers. With Tominy one size fits all.

We have such confidence in the system that we offer it with a 90 day no questions asked money back guarantee.

Because it is not possible to tell you here everything our portable application development system does, we have ready to send you a kit that not only offers detailed information on how the system operates but also shows how it is presently being used to increase productivity and reduce costs in over 1000 installations nationwide, including 25 of the Fortune 500 companies. It's yours free for the asking if you send in the coupon or call (513) 984-6605.

We are sure that after reading it Tominy will make a believer out of you too.

Tominy
Once is finally enough.

☐ I'd like to be convinced. Send me your information kit.
☐ Have a representative call.

NAME (PLEASE PRINT)
TITLE
COMPANY
ADDRESS
CITY STATE
ZIP
( )
TELEPHONE 01-CW-6-11-4

Mail to: **TOMINY** Inc.
Dept. B
4221 Malsbary Rd., Bld. #1
Cincinnati, Ohio 45242

*Tominy's completely portable application development system is presently available for IBM's PC, System/34 System/36 Series/1 43XX 30XX 370xxx, DEC VAX/VMS systems, UNIX and XENIX operating systems

Service bureau, county battling in Illinois court

By James Connolly
CW Staff

PEKIN, Ill. — Through suit and countersuit, a service bureau claimed that county officials owe it almost $10,000 for services, while the county said the service bureau's poor performance cost the county $1.3 million.

Computer Services Center, a division of GC Electronics Co. of Rockford, Ill., sued Tazewell County in county circuit court here in March, claiming the county owes it almost $10,000 for processing and collecting tax bills between 1978 and 1981.

But the county recently responded with a countersuit in the same court. It charged that consistently late mailings of tax bills by the service bureau meant that collections were delayed and interest income lost.

The attorney for the county reported that the litigation came as a surprise to county officials. "In the summer of 1981, there was a dispute over what the county owed Computer Services, and [the firm] held our software with the master tax rolls on it, pending the outcome of the dispute. [Computer Services] demanded a large sum of money, which we paid, and we got our software back. We thought the matter was closed," said Gary Orr, assistant state's attorney for Tazewell County.

The Computer Services suit filed in March demands $10,000, including $3,056 for processing 76,400 tax bills in 1980. Douglas Carter, comptroller for GC Electronics, declined comment on both suits and said that Computer Services is no longer in operation.

Orr said the county filed its suit May 23 in response to the Computer Services suit. The county, which dropped Computer Services after 1981 in favor of a Springfield, Ill.-based firm, claimed that Computer Service's tax bill mailings were 21 to 62 days late.

The county's suit said it lost $1,282,930 in interest income on taxes collected from 1978 to 1981. The county seeks $632,740 just for 1981, when $24.9 million in taxes was collected 62 days late. Investments on that money would have returned 15%, according to the suit.

An enthusiastic visionary, MSA chairman looks ahead

In 1970, when Management Science America, Inc. (MSA) declared bankruptcy, few people would have predicted it would become one of the largest independent software vendors in the country.

But that is exactly what happened, and most observers agree that a major driving force behind this spectacular turnabout and success was John Imlay, MSA's chairman of the board. Imlay is a master showman who delights in giving MSA users something besides computer software to talk about at their annual meetings — he has used live tigers, golden eagles and minicomputers in caskets to keep things interesting.

Imlay is also an enthusiastic visionary who believes that "after 30 years of limitless growth, we [the computer industry] are just reaching our infancy. The excitement lies ahead." The vision is backed up by hard sales for MSA, whose operating revenues for the first quarter of 1984 totaled $131 million.

Imlay was interviewed in his Atlanta office last month by Computerworld *Executive Editor Rita Shoor.*

Q Several major independent software firms are now owned by larger corporations. In light of Wall Street's skittishness about high-tech stocks, is being a public company a financial advantage today?

Absolutely.

Q Why is that?

There are companies like us and [Cullinet Software, Inc.] that had earning streams that allowed us to go public in 1981 and that era. Since that time, we've been back to the public market on several occasions so that we have built a war chest of $87 million . . .

What [going public] has done for us is allowed us to gain the capital to expand the product line. It's allowed us to have visibility within the financial community as well as the prospective buyer area. For example, all the publicity in *The Wall Street Journal* is read by prospective users of our products.

We're here attempting to build a billion-dollar corporation by the end of the decade, and in doing that, we've developed a long-range plan along those ends.

Q What are some of the key elements of that long-range plan?

Now we have 23 products in our financial applications cross-industry lines, and you will see us adding two to four products a year through internal development in that area. You'll also see us complementing the line, as we did last year, by the careful acquisition of entire companies such as Computeristics, which added order processing to our line, and the acquisition of [Arista Software] from [Xerox Corp.], which puts us into the manufacturing area.

You're going to see continued acquisition in the future by the use of the funds that came from the public offering.

Q You mentioned Arista in terms of acquisitions. Do you have any further plans for getting into the systems software market?

In our long-range plan, we set about seven key areas on our wish list, the topmost being specific industry applications. But on that list, also, is the systems software possibility. That would only come through opportunity. Our priority is to supply software for the end user, and right now you'll see us concentrating on applications.

Q You mentioned developing two to four new software packages per year. Is MSA in the process of rewriting any of its current packages from scratch, or are you really going to concentrate on more in-house development of new packages?

What we have developed internally is a very key fourth-generation language. We're not going to sell it as a separate product. It's called Information Quick.

The $38 million which you've seen in research and development is poured into enhancing the products.

The General Ledger [package] today is not the same General Ledger we had three years ago. They're completely real-time; they're attached to data base management systems and so forth. So what I was talking about are new systems that are being developed on top of the ongoing updating of the technology which has been done over the past number of years.

For example, when we bought Arista, we took products which had taken them six years to develop, and we wanted to "MSA-ize" them. So we put our technical capabilities into them — redid them through our internal generation language and have brought them out in under a year.

Q Some applications vendors like McCormack & Dodge Corp., Hogan Systems, Inc. and Cullinet have released to the public as a package the application development tools that they used to develop their own software. Do you have any plans to release your internal development language?

No, we don't. In the situation with McCormack & Dodge, they have developed or are redeveloping their systems under what they call Millennium. There is a big risk in that because they must get Millenium into that user throughout, or the systems won't talk to one another. With Information Quick, we can inquire across borders into existing systems, and we think that's the best strategy.

Cullinet is a systems software company now turning to applications, which is a very good plan for them because we think that's where the action is in the future. The threat there lies in IBM. Will the next generation have built-in data base management, will it have built-in systems software? That's the question mark that really arises.

Q IBM has been growing in quantum leaps (approximately $40 billion in revenue per year), and it's shown little reluctance to penetrate any market niche to feed that kind of growth habit. Could you sum up the pluses and minuses for companies like MSA of this kind of growth by IBM?

First, we all feed off of IBM. And because IBM is a huge corporation with a major share of the mar-

See **IMLAY** page 18

'Applications . . . is where the action is in the future. The threat there lies in IBM.'

'I would say that IBM is our greatest benefactor. But when you sleep with an elephant, it could always roll over at any time.'

'What the micro-mainframe connection does is bring discipline back to the central unit. [It] gives some semblance of control . . . for the whole corporation on how the micros are used.'

'The company that does not . . . automate in every phase . . . could actually fail. What's coming is a total dependence on technology.'

IMLAY

from page 17

ket, we have a de facto standard on which to base all of our development — IBM technology.

The bad news is that there's a realization in IBM that software is now necessary. . . . What's happened is software strategies have come right to the top of IBM, and they've formed an entrepreneurial group much like their [Personal Computer] group that is called IPS [Information Programming Services]. It has its own board of directors, with consulting, the Information Network and software products. So for the first time, they're getting serious, and they're making arrangements with independent companies . . . such as [Comshare, Inc.] on cooperative marketing agreements and with [Artificial Intelligence Corp.] on Intellect, plus trying to bring together their own development techniques.

In the meantime, they seem to have split systems software and applications. Two years ago, they held a "love-in" where they brought just the applications companies — 110 of us — together and they reached out . . . to the independent applications vendors, and they purposely did not invite systems software vendors. . . . So they are now working toward getting the maximum use out of the independent application houses and at the same time slowly getting into the business themselves. I would say that IBM is our greatest benefactor. But when you sleep with an elephant, it could always roll over at any time. So we work hard to complement IBM in every move it makes.

We feel very comfortable that we're needed by IBM, at least in the next four or five years. However, if they purchased a software company or they dedicated themselves to some area, they could eventually become a competitor.

Q What do you regard as major growth areas for MSA's product line over the next five years?

We have grown in cross-industry areas — that means a general ledger which can be used in any industry, for example — and that will continue to grow in the 35% range, mainly because the mainframe costs are coming down.

Then, we have in the mainframe area specific industry types of software. And our first move was manufacturing. As opportunity comes, you'll see us in different specific industries.

The second area that we're looking at is the microcomputer area as a segment in itself. Business [computing] is a major segment of [Peachtree Software, Inc., acquired by MSA in 1981]. The second segment of Peachtree is the home market, and we announced [on May 21] 25 new Peachtree products.

And then the third [microcomputer] area that we're concentrating on is education. We did that through, first, the acquisition of Eduware, one of the major educational microcomputer users, and . . . we announced nine new products to go on that.

The third main area is the micro-mainframe connection. Here we're going after the connection of multiple micros. So we've layered the mainframe software to offload information that can be accessed by microcomputers. We've built the link between the micro and the mainframe, and then, through our Peachtree technology, we have taken word processing, spreadsheet, windowing and so forth and applied it to the microcomputer and bundled it as a package, so that you now have MSA programs in the microcomputer, the link and the programs in the mainframe.

Q How much attention is being paid by MSA to the security problems that have to be a major concern of the person at the head of the information systems structure in user organizations? What kind of safeguards are being built in?

You set priorities and passwords for the workstation unit so that the president can get to everything that he wants, but the middle manager can only get to his information. Those are set electronically, as with any other security or terminal system.

The terminal itself can only get certain information, and it can't get it until the password that particular fellow has goes into the machine. So security is as good as its ever been if it's addressed properly.

What the micro-mainframe connection does is bring discipline back to the central unit. The connection gives some semblance of control for the whole corporation on how the micros are used. It is bringing discipline back that is a strength of the micro-mainframe link.

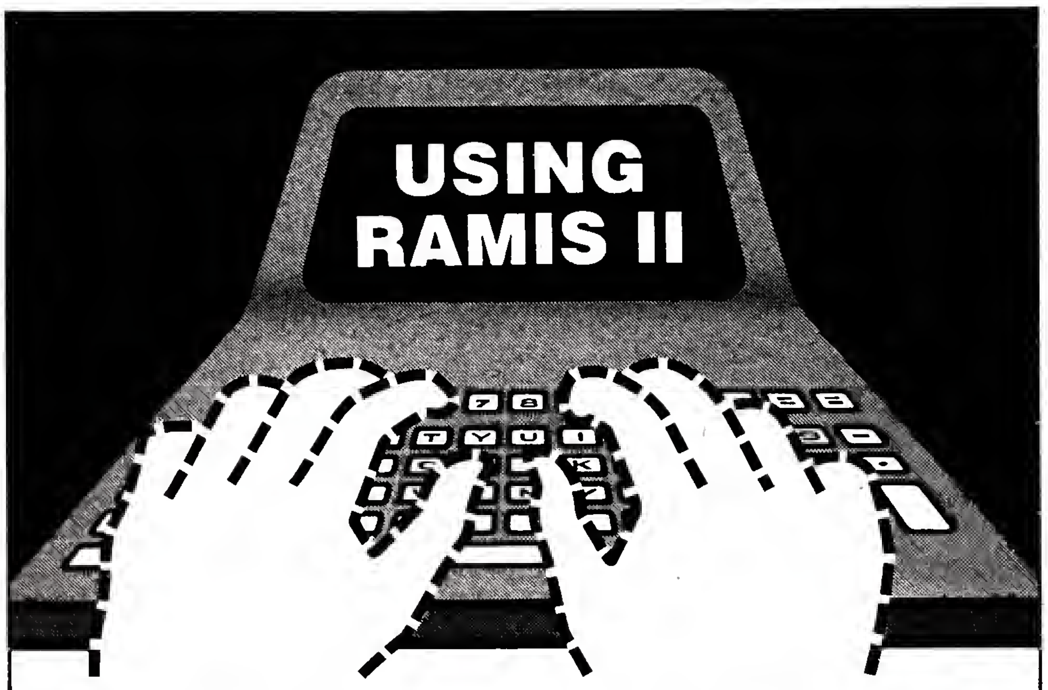
Q What applications are most likely to be offloaded from corporate data centers to micros in the near future?

I think the most significant is financial modeling — the development for the financial vice-president of models necessary to budget for the next year.

Now he'll be able to budget and change the models on his desk, and it gives him such flexibility of predicting the future that it's just an unbelievable change in his mind-set.

Let's take for example a worldwide company, and [its financial vice-president] wants to know what's happening in Singapore. It gives him the ability to go into the mainframe, get Singapore's budget and results and model them right now. Of course, electronic mail will be proliferating . . . There are just myriads of applications that it can be used for . . . [such as] the relationship with the secretarial unit, whereby the secretary will type a letter, and you'll be able to call it up and look at it, correct it yourself or leave him a note to correct it.

The company that does not go micro-mainframe and does not automate in every phase from secretarial to middle management to top management will be getting information later than the competition, and the company could actually fail. What's coming is a total dependence on technology.



USING RAMIS II

Get your hands on
USING RAMIS II

HANDS-ON TRAINING
- Interactive CBT that simulates RAMIS II.
- Write RAMIS II programs right from the start.

THREE COURSES IN ONE
- Basic – Report gerneration.
- Intermediate – File creation and maintenance.
- Advanced – Advanced file maintenance, SCAN, RELATE, EXECUTIVE, and graphics.

GUARANTEED
- Free trial lets you evaluate course.
- No invoice unless you're 100% satisfied.

Call (800) 282-2372
- Inside California (213) 391-6788
- Or send in the coupon for our catalog – today!

RAMIS II is a product from Mathematica Products Group, Inc.

I want **GUARANTEED** training for end users!
Send a catalog of the Crwth CBT Curriculum for the End User of the Information Center to:

Name__________
Title__________
Company__________
Address__________
City State Zip__________
Telephone__________

CRWTH
The Information Center People
613 Wilshire Blvd., Suite 200
Santa Monica, CA 90401

RCW-4

Fourth Generation
Productivity Enhancements for the
SAS® SYSTEM

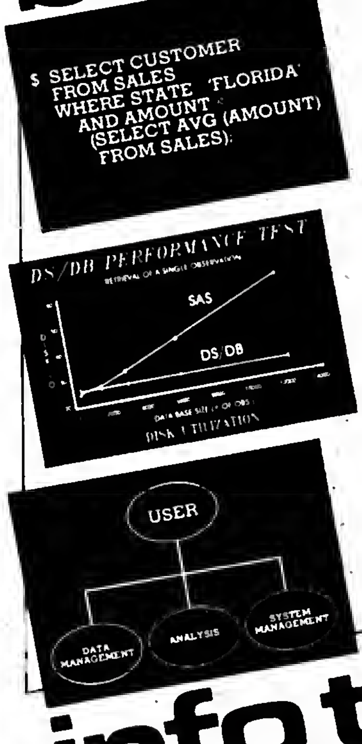
Turn the power of SAS into a total information system for decision support...with DS/Software. Four fully integrated products let you tap the analytical power of the SAS System in a user-friendly environment. So you have immediate, organized access to the information you need for sound decision making.

DS/QL™ An easy-to-use SQL-based query language for SAS. Allows you to ask complex questions of the data base in the form of English-like queries using SELECT...FROM...WHERE expressions.

DS/DB™ A direct-access facility for SAS data sets that increases your data access efficiency without increasing your programming effort.

DS/DM™ A full-screen interactive dialog manager that gives you immediate, total access to your data base and dramatically cuts down on training and technical support.

DS/GEN™ An interactive dictionary-driven information system generator. Allows you to define, generate, maintain and restructure your DSS.



```
$ SELECT CUSTOMER
  FROM SALES
  WHERE STATE 'FLORIDA'
    AND AMOUNT
    (SELECT AVG (AMOUNT)
    FROM SALES);
```

info tech
The Information Technology Company

5700 S.W. 34th Street
P.O. Box 14545
Gainesville, FL 32604
(904) 375-7624

Yes! I'm interested in a total information system for decision support.
Please send me more information on DS/Software and my **free trial offer.**

NAME__________ TITLE__________
COMPANY__________
ADDRESS__________
CITY__________ STATE__________ ZIP__________
OPERATING SYSTEM(S)__________
INFO TECH P.O. Box 14545, Gainesville, FL 32604 (904) 375-7624

- SAS is a registered trademark of the SAS Institute, Inc., Cary, North Carolina. DS/QL, DS/DB, DS/DM and DS/GEN are trademarks of Info Tech.

Operations people get little respect, Afcom chief claims

By Jeffry Beeler
CW West Coast Bureau

LAS VEGAS — If operations people were a city, they would be Philadelphia. If they were a stand-up comedian, they would be Rodney Dangerfield.

The people who do the day-to-day administrative chores that keep information systems up and running constitute an unjustly vilified, downtrodden minority, according to Len Eckhaus, president of the Association for Computer Operations Managers (Afcom).

For years, operations people have been neglected, undervalued and looked down upon as second-class citizens by their computer-room coworkers, Eckhaus said during a recent Afcom conference here. Among the MIS community's other technical specialties, operations has become a synonym for ineptitude and a stock character in an endless series of put-downs and insult jokes, he added.

If a system turns balky or a production job falls behind schedule, chances are that operations will be the first to be blamed. If all the various groups within a systems department simultaneously request help in overcoming a serious problem, chances are that operations will be the last to be served. If a user organization is contemplating the development of a new application, chances are that comments will be solicited from every systems discipline except operations, Eckhaus said.

Why are the professional lives of operations people so difficult? Part of the reason is that their specialty lacks the "glamour" of programming and systems analysis, where the computing field's creative and intellectual elite are popularly thought to congregate, according to Ray Ybaben, TRW, Inc.'s manager of office automation in Redondo Beach, Calif.

Another reason for the widespread hardships is that operations people have traditionally lagged behind their systems development counterparts in formal education. "Almost everyone who works in systems development is at least a college graduate, and many have master's degrees," Ybaben said during an interview at the Afcom conference.

In operations, by contrast, college diplomas are comparatively rare. "Because they have generally had much thinner educational backgrounds than systems developers, operations people have not been in a particularly strong position to assert themselves," he said.

Within just the past three or four years, however, conditions in the operations sector have slowly begun to change. As the business world's recognition of MIS's strategic importance has steadily grown, the demands on operations personnel have inevitably intensified.

"Large corporations today are expecting higher systems availability, tighter production schedules and fewer foul-ups than ever before," Ybaben said. "They've learned that how well a company functions depends on how well operations functions, especially with the growing movement toward on-line systems."

In response, operations people are gradually being forced to upgrade their job skills and return to school to strengthen their academic credentials. As their level of professionalism has slowly risen, the snickers and snide remarks about operations have finally begun to subside, Ybaben said.

Of course, operations people are still a long way from matching the professional stature of programmers and systems analysts. Even in large corporations, where progress toward parity is comparatively advanced, operations is still probably three or four years away from gaining true equality with systems development, Ybaben said.

But one fact can scarcely be denied: Unlike comedian Dangerfield, operations people are finally beginning to gain some hard-earned respect. For the first time, Ybaben said, "large corporations are finally beginning to recognize the need to recruit top talent for their operations departments." At the same time, systems development and operations personnel are starting to swap positions at the management level — a phenomenon that reportedly emerged only recently.

Another sign that operations is gradually coming of age is that the nature of the discipline has begun fundamentally to be redefined, Ybaben noted. Once identified primarily with menial tasks like "pushing buttons" and "mounting tapes," he observed, operations people are now increasingly graduating to management-level responsibilities, including planning, scheduling installations of new equipment and coordinating jobs with end-user departments.

For MIS directors, the growth in operations' stature and professionalism is "definitely a positive development," Ybaben said. "In the past, operations was the part of the systems organization where DP managers were weak and vulnerable to criticism. Now, the weakness is beginning to become a strength and to contribute significantly to the overall systems effort."

Somebody should invent a way for different microcomputers, different terminals and different systems to communicate together.

The PCM 2000. A new dimension in communications that greatly expands the capabilities of personal computers and terminals. It makes different systems, at different sites, with different requirements, all conversive with each other. Like the IBM PC, IBM XT, Televideo, Qume, Columbia, and a variety of mainframes.

The Professional Communications Manager (PCM) ***improves information flow*** and typically ***saves up to 60%*** of standard telephone usage charges. It also expands the power of your personal computer. Features include: concurrent printing, completely automatic after-hour communications and electronic mail options.

In business applications the PCM provides substantial savings in connect time and productivity. Users can enter data while off-line and then batch transmit to a central computer or time-share bureaus using standard telephone service. Custom designed, application-dependent formats are now available for such businesses as insurance and travel to further simplify operation.

As a single source supplier, BetaCom offers complete communication packages. We are an IBM dealer providing personal computers, the PCM 2000, software packages, on-site training, testing and service.

The PCM 2000 is an inexpensive, easy to operate front-end processor for your personal computer or terminal. For more information please call us, ***toll-free 1-800-BetaCom,*** operator 55. (Distributor inquiries invited.) The PCM 2000 from BetaCom, your single source for advanced data communications and text messaging.

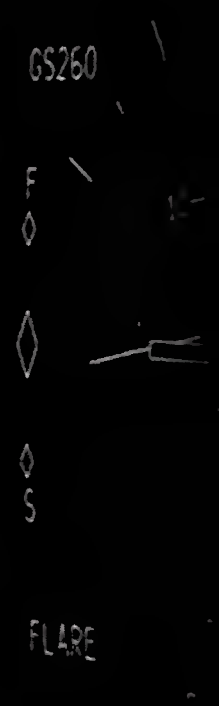
Somebody did.

BetaCom

Wide Area Networking™

245 East Sixth Street Suite 809A St. Paul, MN 55101
TOLL FREE NO. **1-800-BETACOM** Operator 55. In MN 612-292-8273
Call or write for a free brochure.

"Rockwell International eliminates order management paperwork and ships products faster with a Tandem NonStop™ Computer System."



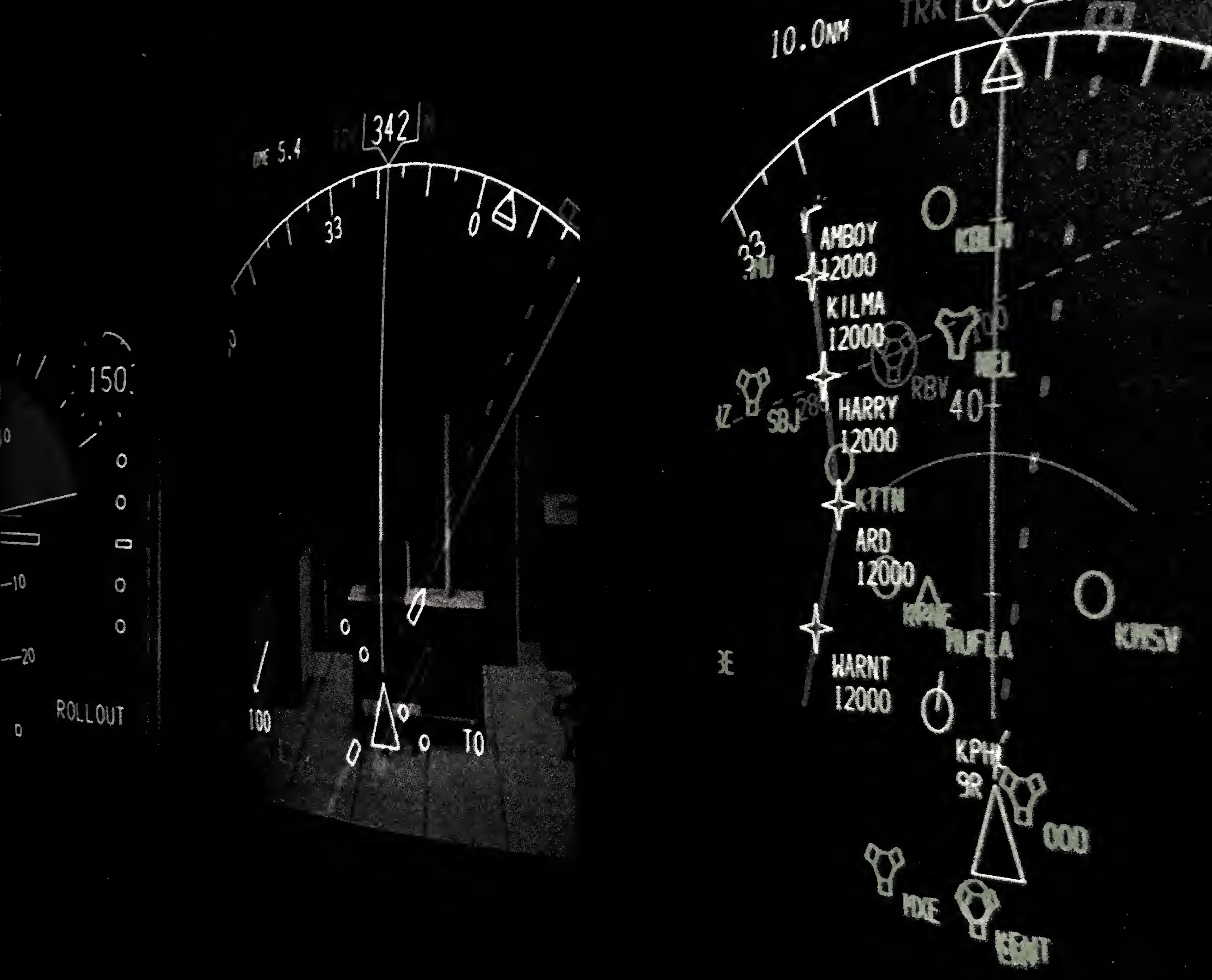
Robert P. Marovich, VP and Controller
Avionics Group
Rockwell International Corporation

"Our Tandem NonStop computer helps us dramatically streamline order tracking for our broad line of products here at the Collins avionics facilities in Cedar Rapids. This automated operation has meant we've been able to ship our products faster, as well as respond to customer inquiries in a much more timely, accurate fashion.

"The Tandem system consolidates all data pertaining to the orders, from order entry to scheduling, inventory issue to packing lists, and right on down the line to shipping. And, because the system is on-line, other departments have immediate access to this information as well; Accounting, for example, now generates invoices automatically, resulting in much improved cash flow; Manufacturing is saving $175,000 a year in internal freight charges due to the reorganization of ordering and shipping procedures; and the Group as a whole has been able to eliminate more than 300,000 reproduced documents a year.

"Other system benefits contributing to our improved customer service include better control of backorders, more accurate pricing information, and the ability to make detailed forecasts of market conditions for planning purposes. The net result is an operation that is helping us achieve some very significant gains in plant productivity."

The NonStop System. Ideally suited to on-line transaction processing where continuous availability of up-to-the-second information is critical to your business.



Tandem. Fully supported by a worldwide sales, training, service and manufacturing organization.

For information on how a Tandem NonStop system can improve your productivity or your P/L statement, call your local sales office or Tandem Computers Incorporated, 19333 Vallco Parkway, Cupertino, California 95014, U.S.A. Toll Free 800-482-6336 or (408) 725-7500 in California.

TANDEM

NonStop Transaction Processing

© 1983 Tandem Computers Incorporated

Council's systems director a one-man DP department

Running DP operations for nonprofit group meant becoming jack-of-all-trades

By David Myers
CW New York Bureau

NEW YORK — Julio Devia can do it all. Not that he wants to, necessarily, but when you're head of a $250,000-a-year data processing operation for a nonprofit religious organization, you have to be as good with a screwdriver as you are with job control language operating system software.

Earlier this spring, Devia was elected director of systems and programming for the National Council of Churches of Christ (NCCC), a missionary and educational group made up of 31 Protestant and Eastern Orthodox churches. But the title of director is a trifle deceptive — the 40-year-old native of Bogata, Colombia, is not only the head of DP, but also the programming crew, the systems analyst, the data communications specialist and the maintenance staff.

"That's the trouble with working for a not-for-profit organization," Devia's boss, NCCC Chief Financial Officer James Styer, told *Computerworld* during a recent interview at the council's headquarters here.

"We live in a fishbowl. Everybody's watching, and we're constantly having to justify what we do and how much we cost. One restriction is that we've got one guy [to man the entire DP operation]. All the problems end up right here." He pointed to Devia.

Devia, however, is a modest and unassuming man. Despite a record that many another DP shop might envy — complete transition from an IBM 360 card-punch system to a Burroughs Corp. B1985 dual-processor mainframe in just eight months, with but two days lost to downtime in the entire first year of the computer's 24-hour-a-day operation — Devia is not about to fold his arms across his chest and relax.

"Okay, we have a computer," he said. "But there is much to be done." He turned to Styer for help with his English, a language that still proves balky and unfathomable to him at times. "Before Julio, the DP situation at the council was bad. Now we're trying to build credibility with our users," Styer explained.

Devia is now involved in compiling a data base for use in fund-raising by the council's member churches. Implementing the financial data base may force the council's word processing users off the system, but Devia still hopes to find some way to avert that.

"We don't want to lose the workstation concept," Devia said, explaining that intelligent terminals "make it easier to tap into the mainframe." To permit personal computers to overrun the council's offices, as NCR Corp. machines already have in one department, would be to lose the advantage of a mainframe and lose the personal computer user as a user of the central system, he pointed out.

But even the fact that Devia and the Council of Churches are facing such vexations is a testament to how far both have come.

Styer said the card-punch system was bad. Checks had to be typed manually before they could be processed by the card machine. But the systems planning and documentation performed before Devia came on the scene was even worse. "The system is there," he said, pointing to a short row of beaten three-ring binders on a nearby bookshelf.

Normalcy needed

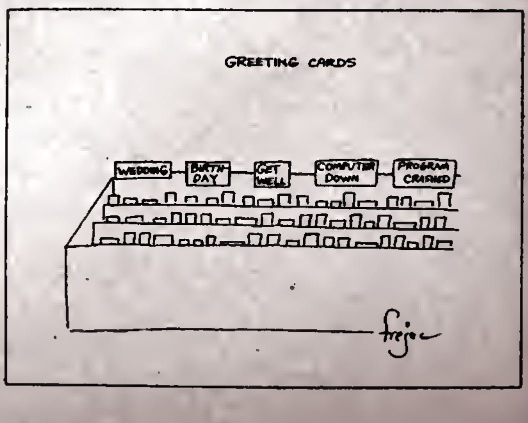
"We desperately needed to normalize our operations," Styer recalled.

Enter Devia, who knew what Styer was feeling because he was feeling the same way about his life.

After six years as a programmer for Banco Cafetero, a Bogata bank, and almost as many years spent studying systems engineering at night school, Devia was still stuck on an IBM 3500, a hanger-on from the era of magnetic-core memories. Then, suddenly, he got the chance to come to America.

Although his $32,000 annual salary is low by current MIS standards, and his array of talents from simple maintenance to systems engineering might make him attractive game to executive headhunters, Devia is not about to leave the Council of Churches.

To Devia, it's a matter of principle: "I am grateful to the organization for giving me my first job [in America]." And, he repeated, "there is much still to be done."



CORPORATE JET

COLOR INK JET PRINTING FROM DIABLO

Illustrate your point beautifully with the Series C color ink jet printer from Diablo. The Series C gives you a rainbow of seven solid colors to produce literally thousands of shades for quality color graphics, including charts, graphs and presentation visuals (it even prints directly onto transparencies).

The low profile and incredibly quiet operation make this non-impact printer a welcome addition to any office. So, whether yours is a personal computer, a professional workstation or a small business computer system, you'll find the Series C the economical way to add beautiful color to your computer output.

Find out where you can see this and all the other fine Diablo products by calling 800-556-1234 ext. 186. In California call 800-441-2345 ext. 186. Diablo Systems Inc. Fremont, California.

Diablo Printers

High price of stress taking its toll on your DP staff?

STRESS IN THE DP SHOP
Part 1

By Dr. Paul E. Greenfield
And Larry Raskin
Special to CW‡

Part 1 of a three-part series.

Can your DP installation afford the turnover price of two months' salary when a skilled technical employee quits? Or the $60,000 to replace a key senior manager?

Those are the approximate costs when an overstressed employee leaves for a healthier work environment.

Stress is becoming increasingly familiar in DP shops as companies struggle for a competitive edge. How does stress affect you, the MIS manager, your employees and your organization? Is it the inevitable partner of your drive to develop the next application and meet the next deadline? Can you have success without stress?

Stress is simply the physiological reaction to any demand, actual or perceived. All change and challenge create stress. It can stimulate, excite and demand one's best efforts. But unchecked and unrelieved, stress can take a heavy toll on personal and organizational health.

Losses totaling billions of dollars annually have been ascribed to:

- ■ Poor performance caused by headaches and digestive disorders.
- ■ Stress-related absenteeism.
- ■ Low morale resulting from stressful work environments.
- ■ The treatment of migraines, ulcers, back pains and emotional disorders.

The ultimate cost of excessive stress, however, is early death. "When an executive dies or is debilitated by heart disease at age 45," states a management trainer for IBM, "his skills and knowledge are lost and wasted for the years between 45 and 65. That costs money to the company that trained him."

Stress is rooted in the oldest of human reactions. Instinctively, when threatened by a tiger — or a deadline, an angry boss or an impending performance review — one prepares biologically either to fight or to flee. The nervous system readies the body for immediate action. The heart rate increases, adrenaline-filled blood is pumped to muscles and organs, sweating increases to aid cooling and pupils dilate to sharpen vision.

While your body is ready for dramatic action, however, you will probably react in any number of less primal ways. Instead of fighting or fleeing as a reaction to stress, your muscles tighten, you get a headache, develop an upset stomach, lose concentration or develop negative thoughts. You may express irritability with a subordinate or "take it home with you." The cost to your physical and mental well-being can be very high.

Dr. Meyer Friedman and Dr. Ray Rosenman identified two personality types, Type A and B. Type As are more likely to suffer illness from stress-related situations.

People with Type A profiles are often high achievers who view the world as an arena in which to do battle. They value life by what they collect: money, awards, projects, departments, subordinates. Often unable to shift from a mentally and physically aroused state, they remain stressed. Typical Type A behaviors include:

- ■ Vocal explosiveness.
- ■ Constant motion: rapid talking, eating, moving; feeling guilty about "doing nothing."
- ■ Impatience: finishing others' sentences, talking more than listening, changing topics, hating to wait in line and in traffic.
- ■ Neglecting the arts, leisure and hobbies.
- ■ Under constant time pressure, often over-scheduled.
- ■ Competitive in most situations, often when inappropriate.
- ■ Nervous actions: tics, grinding teeth, exaggerated body language.
- ■ An emphasis on quantity over quality.

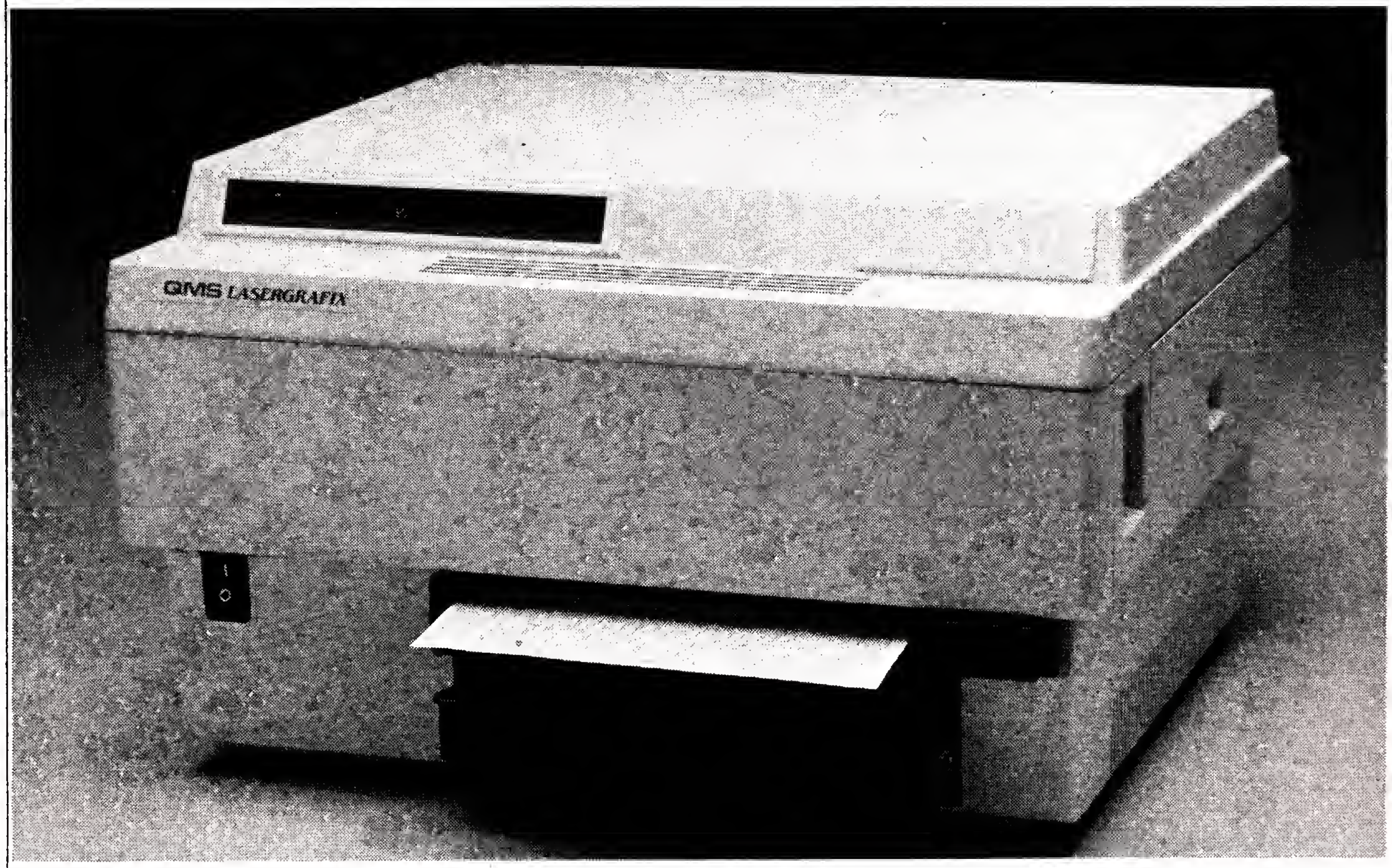
Type B people, on the other hand, gain satisfaction from realistic appraisals of their abilities and limitations. They find self-worth as they build satisfying relationships and accomplish personal goals. For them, stress is an occasional occurrence related to particular challenges or unusual circumstances. Type B behavior includes:

- ■ Scheduling, prioritizing and setting limits to avoid feeling overwhelmed.
- ■ Making time for recreation, relaxation or "doing nothing."
- ■ Listening to others; valuing others' opinions and concerns.
- ■ Patience, especially when they have no control over a situation, such

See **COST** page 24

Greenfield and Raskin are consultants with Stress Management Consultants, Inc., Cambridge, Mass. Greenfield is also a psychotherapist in private practice. Raskin is a senior training specialist at Automatic Data Processing, Inc., Waltham, Mass.

New from Quality Micro Systems.
A price breakthrough in laser imaging technology.



Introducing the QMS Lasergrafix™ 800.

Now you can bring laser print technology right to your desk for all your business and industrial graphics needs. The Lasergrafix™ 800 from Quality Micro Systems brings full bit-mapped graphics capabilities down to true desktop size. And if you thought the flexibility, convenience and economy of laser print technology was priced over your head—look down—to under $10,000.

For letter quality word processing. Bar charts. Pie charts. Even barcodes. Full bit-mapped page memory lets you mix text and graphics, different letter sizes and type styles—all on the same page—even on the same line. The Lasergrafix 800's intelligent controller takes simple print commands through your normal data stream. So your computer's memory resources are free to do other important work.

And, QMS intelligent applications firmware is standard throughout our entire growing family of electronic page printers. So your Lasergrafix 800 can be part of a print applications master plan—a plan which can include the pioneering Lasergrafix 1200 for more continuously print intensive locations.

You get whisper quiet performance. So you can place a print workstation with the efficient printing speed of eight pages per minute, almost anywhere you need one. And the Lasergrafix 800 interfaces with just about any computer system you can name. So you can be up and runnning in no time—in the hottest new direction in the graphics field—down. With the Lasergrafix 800 from Quality Micro Systems. Ask for a demonstration today.

☐ Send me the Lasergrafix 800 information Packet, samples of mixed fonts, graphics and everything else it does.
☐ Please contact me to arrange a demonstration.

Name: ____________ Title: ____________
Company: ____________
Address: ____________
____
Type of system you are now using: ____________
Number of print workstations you are considering: ________
Prime applications for printer: ____________

QMS®
QUALITY MICRO SYSTEMS, INC.

P. O. Box 81250 • Mobile, AL 36689
Telephone (205) 633-4300 Telex RCA 26 60 13
WHERE IMAGINATION LEADS

A major look at the mini mart — with your help

Is the minicomputer an endangered species, assaulted by high-powered, multiuser microcomputers on the low end and by robust 32-bit superminicomputers at the high end?

Computerworld's August Special Report will take a look at how minicomputers and small business systems are used in large corporations and small businesses, at how they are used as turnkey systems and at the integration of these systems into vertical markets.

In addition, there will be stories about minicomputers and small business systems in distributed processing setups for general data processing and about dedicated minicomputers used for transaction processing.

Contributions to the Special Report should take one of two forms: a tutorial article, discussing an issue or trend, or an application story, outlining a particular user firm's experience with a minicomputer system.

Articles for the Special Report must be typed, double-spaced and can range in length from four to six pages. Artwork such as charts, graphs and photographs is welcome.

Authors should include a brief biography and a telephone number at which they can be reached.

The deadline for submissions to the Special Report is June 27.

If you have a story you would like to tell or any questions to ask, send them to Donovan White, Special Reports Editor, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

Now PCs and Mainframes Share the Workload.
Perform Data Entry on Your PC;
Execute Flawless PC-to-Mainframe Communications.

Until Datalex you've had to turn personal computers into "dumb terminals" to communicate with a mainframe.

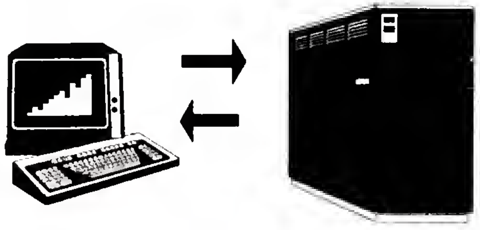
Now, data entry can be accomplished at the PC level. Then passed to a mainframe. Turning your PCs into integral units of your corporate data processing network. And freeing your host computer to work on the jobs it does best.

Entrypoint™ and Passport™: A Winning Combination.

Entrypoint is Datalex's high performance data entry software. It supports high volume, commercial grade data entry in a stand-alone or distributed environment.

Passport is our high quality, asynchronous remote communications program that provides error-free, bi-directional file transfer capabilities between most microcomputers and mini or mainframe hosts.

Together, they provide a communications link with your mainframe, batch management capabilities, high-volume capacity and an interactive screen. Which is more than any other system offers you.



And, like all Datalex software, they're available for personal computers from IBM, Digital Equipment Corporation, Hewlett-Packard, Wang, Sage, and others. And come with 90 days of installation and telephone hotline support.

All at a cost much lower than you'd expect.

For more information call Datalex at (800) 962-8888.
In California, Alaska and Hawaii, call (415) 541-0780.

Yes, please send me more information on Entrypoint and Passport.

Name ____________________
Title ____________ Telephone ____________
Company ____________________
Address ____________________
City ____________ State ______ Zip ______

Datalex
650 Fifth Street
San Francisco, CA 94107

Datalex

COST

from page 23

as waiting in traffic and in lines.

- Relaxing without guilt, working without agitation.

Because environment and personality constantly interact, a high-stress environment will greatly affect, change or even drive out a Type B employee. This environment can also exacerbate Type A tendencies, hastening stress-related illnesses.

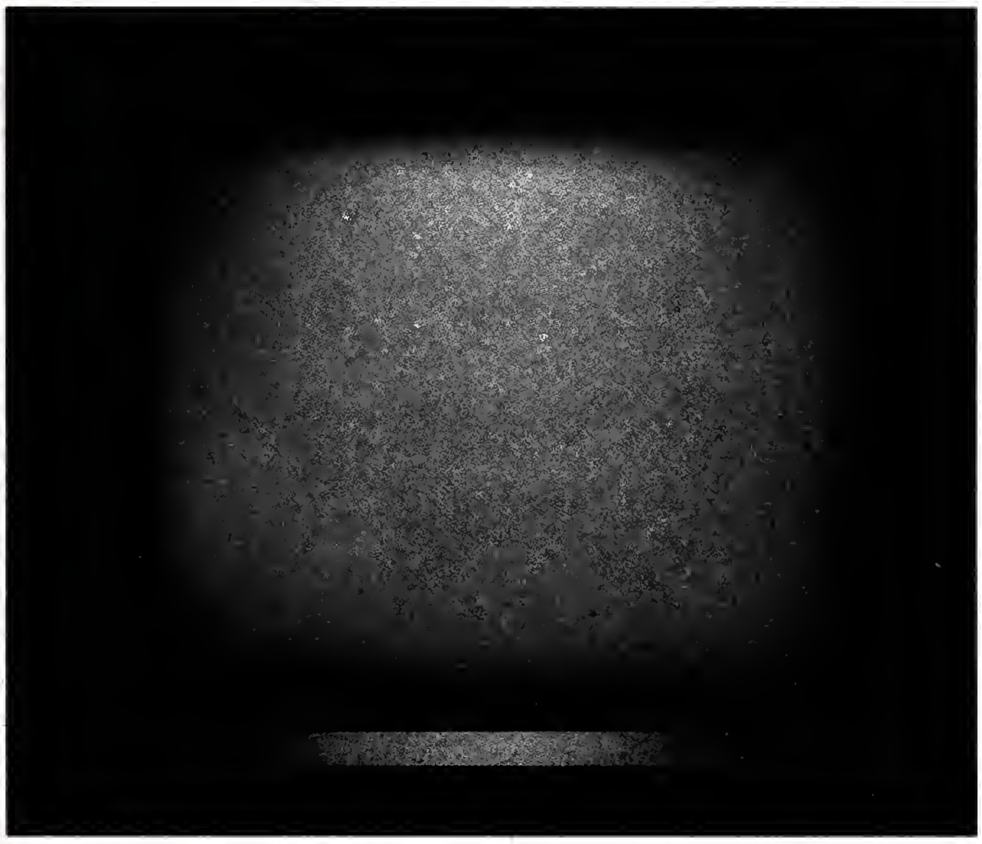
Organizational stressors

We have identified six factors that can produce stress in organizations. You may want to assess more closely how they affect you and others in your DP shop:

- Ambiguity. How clear are corporate and departmental goals? Do your employees have job descriptions and performance objectives? How often is feedback given? How vague or distinct are lines of authority and areas of responsibility?
- Conflict. What is the degree of conflict between management and nonmanagement? Between departments, divisions, coworkers? How is conflict dealt with: ignored, avoided, talked about openly?
- Overload. How often are there deadlines? How many hours per week are people really expected to work? To what extent do policies and procedures help people balance their work and personal lives?
- Change. How often do roles, responsibilities and reporting relationships change? How often are procedures revised? To what extent is the impact of change part of the planning.
- Responsibility. How skilled in management are people in positions of responsibility? How well do they plan, organize, communicate, delegate?
- Physical factors. How much does the physical environment (noise, lighting, temperature, furniture, equipment) contribute to stress? How available are fresh air, healthy food, privacy and common areas?

While no working environment is impervious to the negative effects of stress, it is possible to balance work demands and eliminate unnecessary physical and emotional strain.

Before TEMPLATE®, graphics software that ran on mainframes and minis and micros all looked like this.



Which is to say, nonexistent. Some manufacturers make graphics software packages for mainframes. Others for minis. Still others make it for micros. But no one made high-level graphics software that ran on all three.

TEMPLATE just changed all that. By becoming the *only* high-level graphics software available on micros, minis and mainframes. And it took our extensive experience in graphics software to do it.

Now all computer-using design engineers and scientists can utilize the industry's finest software. And bring mainframe applications right to the bench. Or vice versa. Which means TEMPLATE's device-intelligence and computer-independence is even further enhanced. And you get the graphics functionality for mechanical and electrical CAD, scientific analysis, seismic work, VLSI, and molecular modeling that puts TEMPLATE in a class by itself. In any environment, whether it's batch or interactive, 2D or 3D.

TEMPLATE features table-driven architecture, 3D software display lists, metafile capability over 250 user-callable FORTRAN routines, workstation model, post processing capability, run-time selection, and complete support functions.

So when you're looking for graphics software that'll run on *all* your computers, call Megatek.

And find out all about TEMPLATE.

The product that just gave micros, minis, and mainframes a new computer graphics image.

MEGATEK CORPORATION
® A UNITED TELECOM COMPANY
Making History out of State-of-the-Art

See us at SIGGRAPH, Booth 1018, July 24-26.

World Headquarters • 9605 Scranton Road • San Diego, CA. 92121 • 619/455-5590 • TWX: 910-337-1270
TEMPLATE is a registered trademark of MEGATEK CORPORATION.

Holistic view key in IBM systems change, users told

By James Connolly
CW Staff

NEW YORK — A decision to replace an IBM System/34 with a System/38 requires an organization to examine hardware costs, software conversion costs and to decide whether the System/38's relational data base capability is justified from a business point of view, users were told here recently.

"What we are emphasizing is that it's a combination of a business decision and a technical decision. A lot of people look at it just as a technical question," said Michael Blum, a manager for Peat, Marwick, Mitchell & Co., at a seminar on System/38 conversions cosponsored by Peat Marwick and Imrex Co., Inc.

Blum and Imrex Vice-President Izzy Schiller, whose firm provides System/38 software conversions, warned users about pitfalls they may face when deciding whether to convert to the System/38 and during the conversion process itself.

Blum said a feasibility study is the first step in deciding whether to shift from a System/34 or System/36 to a System/38. He said the organization should consider whether or not they will need System/38's relational data base and interactive computing capability, or whether the batch and file management-oriented System/34 or 36 is adequate.

System/38's pluses

He said the System/38's data base management advantages include interactive computing and the ability to change a file and simultaneously update all related files with the new data.

Other considerations should include such questions as how long parts of the system will be shut down for conversion and how much training will be needed to cope with conversion.

But Schiller noted that even when the upgrade decision is made, managers must decide whether to rewrite their System/34 software or run conversion programs to move that System/34 software into a System/38 environment.

Rewriting programs allows enhancement of the system — the addition of new functions demanded by users — but rewriting is more expensive and time consuming than conversion.

Converting a System/38 to RPG-III may require three months of work, compared with six to nine months for rewriting, leaving extra time for writing new applications, Schiller added.

He commented, "I know very well that the conversion aid offered by IBM doesn't have a good reputation. But it has been improved with later versions." He said the $1,600 conversion package is 99% effective, if several precautionary steps are taken.

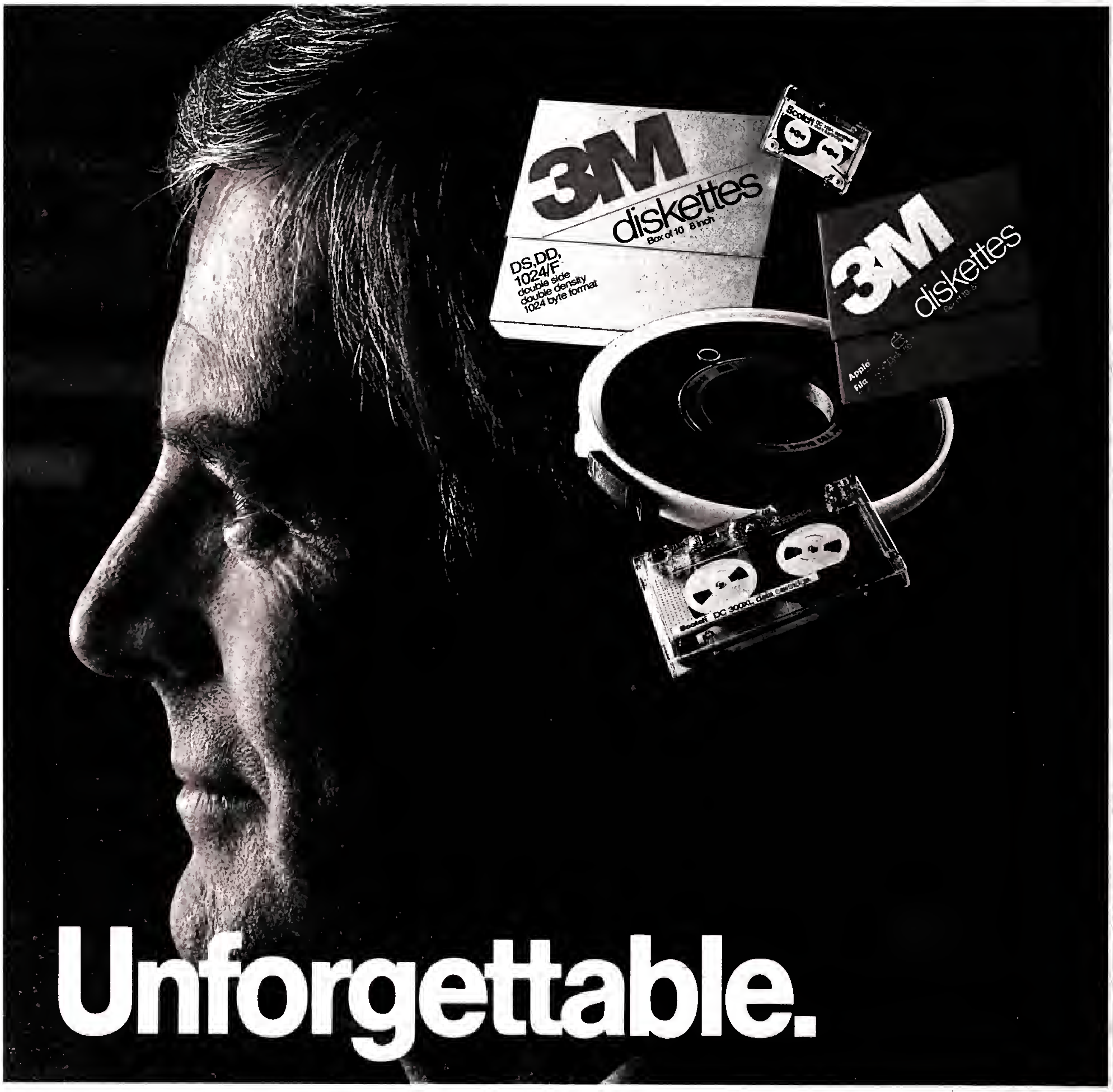
Schiller advised developing a strategy and a schedule for the conversion, using the latest available version of all resources, ensuring that field names are different from file names and that procedure names are different from RPG-II and screen format names.

Schiller recommended renaming programs to search for duplicate names and modifying those names rather than conducting manual searches.

The actual conversion involves running a single type of source at a time, converting data directly by copy-file and testing.

Schiller also noted that a common problem in conversion is that programmers use System/34 instructions when writing programs for the System/38 and that education has been lacking with regard to System/38, even at IBM.

Schiller and Blum said an organization is likely to spend more money for programmers under System/38 because, while the System/38 requires the same number of personnel, it requires more specialized people.



If it's worth remembering, it's worth 3M data recording products.

3M computer media products remember everything, every time. Their reputation for reliability is backed up by something very rare in the magnetic media industry: over thirty years of manufacturing experience. That experience, plus the fact that 3M controls the entire manufacturing process, assures that the same high quality is built into every computer media product we make. So you can have complete confidence in every 3M data cartridge, diskette, and roll of computer tape you buy.

Insist on the best for all your DP needs. Insist on information processing products from 3M. Inventor of the data cartridge and the world's largest manufacturer of flexible magnetic media for the home, office and computer room.

Look in the Yellow Pages under computer supplies and parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M data recording products.

3M hears you...

3M

"How I increased user satisfaction with the flick of a switch."

"MY DP DEPARTMENT WAS UP TO HERE IN WORK."
"AND ROUTINE END-USER REQUESTS WERE JUST ADDING TO MY BACKLOG- UNTIL I HEARD ABOUT THE SOLUTION CENTER."
Solution Center
"IT'S A COLLECTION OF USER-FRIENDLY PRODUCTS THAT ALLOWS ALMOST ANYONE TO DO THEIR OWN DATA PROCESSING."
"THAT WOULD MAKE THEM VERY HAPPY."
"AND ME A LOT HAPPIER TOO."
"SO I TALKED TO HONEYWELL, SET UP A SOLUTION CENTER, AND..."
"BILL, I NEED AN ANALYSIS OF WESTERN DIVISION SALES DESPERATELY."
"CLICK."

Introducing The Honeywell Solution Center.

Now there's a way you can increase the satisfaction of your end users and improve the responsiveness of your information management system. It's called a Solution Center.

A Solution Center is a user-support facility that enables personnel throughout your organization to do their own data processing, quickly and easily. And it enables you to give them direct but controlled access to online information.

Increases Productivity

A Solution Center features Honeywell's GCOS8 software that ranges from personal productivity and decision support tools to business-specific solutions. So now your end users can build their own spreadsheets, forecast trends with color graphics, browse through online files, and create or revise reports.

Think of how that could increase their productivity as well as their satisfaction. And, by freeing the MIS staff to do more of the significant tasks they were hired to perform, a Solution Center can increase the productivity of your data processing department, too.

Improves Data Management

A Solution Center improves data management by providing consistent information to end users and by eliminating unnecessary application development. It can facilitate the introduction of personal computers. And, best of all, you can tailor it to meet your specific needs.

With a Solution Center, end users get the information they need and you get the control you demand. It's bound to make them a lot happier, and you a lot happier too.

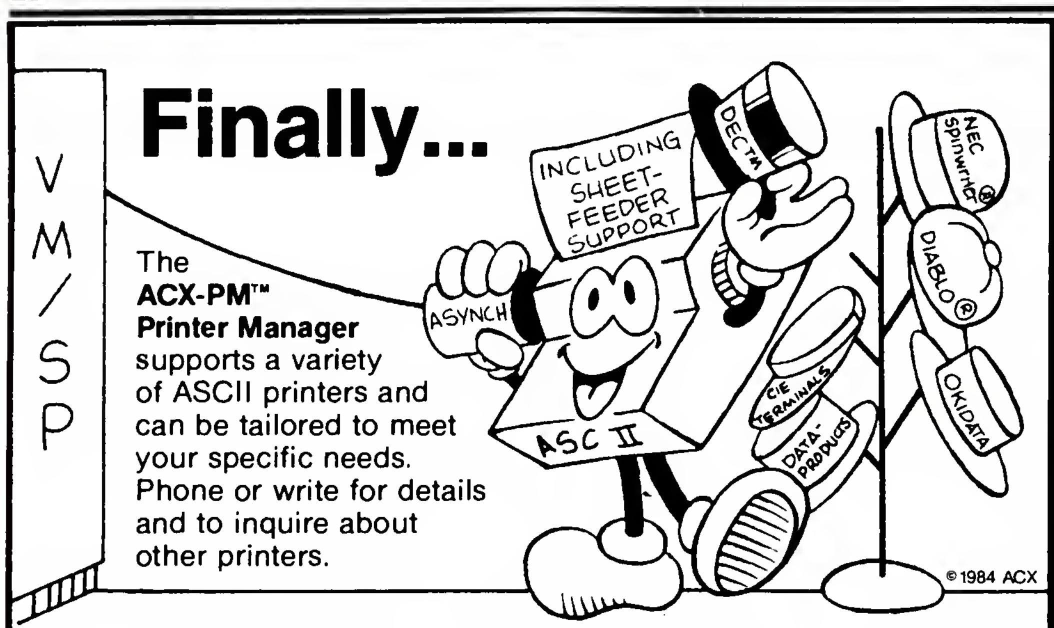
For more information on how a Solution Center can work for you, call toll free at 800-328-5111, extension 2724. In Minnesota, call collect 1-612-870-2142, extension 2724.

Another Big Idea From Honeywell Large Systems

Look to Honeywell Large Systems for solutions to information management problems and for products ranging from powerful computers to comprehensive networking capabilities.

Together, we can find the answers.

Honeywell



Finally...

The **ACX-PM™ Printer Manager** supports a variety of ASCII printers and can be tailored to meet your specific needs. Phone or write for details and to inquire about other printers.

And unparalleled support for IBM 326X, 328X, and 3287 graphic printers.

ACX®
Autovative Computer Extensions, Inc.
5120 Belmont Road, Suite B
Downers Grove, Illinois 60515
(312) 971-1505

DEC is a trademark of the Digital Equipment Corporation.
Diablo is a registered trademark of Diablo Systems, Inc., a Xerox Company.
spinwriter is a registered trademark of NEC Information Systems, Inc.

NEWS

Opposition to VDT regulation continues in House hearings

By Mitchell Betts
CW Washington Bureau

WASHINGTON, D.C. — Asserting that VDTs do not pose radiation health hazards, the printing and publishing industries last week urged Congress not to regulate VDTs, but instead to foster research on ergonomic design to make VDT use more comfortable.

At a June 5 House of Representatives subcommittee hearing, industrial hygienists from the American Newspaper Publishers Association (Anpa) made a dramatic "show-and-tell" presentation that included actual radiation meter readings on a VDT placed in the subcommittee's hearing room. The tests repeatedly showed that the VDT did not increase radiation levels above the "background" readings already present in the room from natural sources, the Anpa hygienist reported.

George Cashau, Anpa director of technical research, said the Anpa technical team has tested about 1,000 VDTs at member papers to allay staff fears, and "we have never found a radiation emission which even approached the federal standard."

The testimony showed that the publishing industry would like to close the book on research about VDT radiation. "As for further study," Cashau testified, "we do not believe it is necessary in the radiation area; but would welcome further study in the ergonomic area, which is still evolving."

But Anpa officials opposed any legislation that might regulate VDT radiation emissions or ergonomic designs. "There are no clearly defined ergonomic standards," Cashau testified. "By cavalierly embracing one standard over another in a regulation, we would be retarding the progress which continues to be made in the design of workstations, including keyboards, screens, furniture and lighting."

Testimony by the Printing Industries of America, Inc. and the National Association of Printers and Lithographers opposed government regulation of VDT designs. Acknowledging that older VDTs lack ergonomic features, spokesman Frank Romano said these older VDTs will be replaced over the next four to five years with newer designs.

"We expect the low-priced personal computer, which meets most ergonomic requirements, to become the replacement unit for typesetting-related VDTs," Romano testified.

Conflicting testimony

The hearing was part of a yearlong investigation of VDT health effects by the House Committee on Education and Labor's Health and Safety Subcommittee.

Rep. Joseph M. Gaydos (D-Pa.), the subcommittee chairman, noted that the panel has heard conflicting testimony, including comments by labor unions and other user representatives, that VDT radiation from malfunctioning units can cause eye ailments and birth defects.

After the hearing, Gaydos said he does not intend to push legislation regulating VDTs unless the industry fails to resolve the health concerns. "I'd like to see the industry regulate itself," he said.

'I'm not sure, I think he's cramming for his computer final.'

UNIX® IS A DINOSAUR
CP/M® & MS-DOS™ ARE TOYS
MULTI SOLUTIONS PRESENTS
THE WORLD'S FIRST
4th GENERATION
OPERATING SYSTEM

S1™

A SERIOUS OPERATING SYSTEM
FOR TODAY AND TOMORROW

- PORTABLE
- MODULAR
- MULTIUSER
- MULTITASKING
- MULTI PROCESSING
- PARALLEL PROCESSING
- 64 CHARACTER NAMES
- 3 COMMAND PROCESSORS
- REAL TIME
- NETWORKING
- DISTRIBUTED PROCESSING
- HIERARCHICAL DIRECTORIES
- KEYED FILES
- ISAM
- VSAM
- B-tree
- RECORD LOCKING
- UNIX SOURCE COMPATIBLE
- WINDOWING
- BIT MAPPED DISPLAYS
- FULL SCREEN MANAGEMENT
- FULL SCREEN EDITING
- FULL MEMORY MANAGEMENT
- VIRTUAL MEMORY
- SEMAPHORES & LOCKS
- EXTENSIVE UTILITIES
- AND MUCH, MUCH MORE

S1 IS THE ONLY OPERATING SYSTEM WORTHY OF THE TITLE:
"THE NEXT WORLD STANDARD."

ONLY S1 DOES IT ALL.
NO OTHER OPERATING SYSTEM COMES CLOSE. CUTS DEVELOPMENT TIME FROM MAN YEARS TO MAN MONTHS.

MULTI SOLUTIONS INC.
Multi Solutions, Inc.
Suite 207
123 Franklin Corner Rd.
Lawrenceville, N.J. 08648
609-896-4100 Telex: 821073

Please send for our FREE S1 Book or Call 609-896-4100

IN TIME, ONLY THE BEST WILL SURVIVE: S1

*Reg. Trademarks: CP/M of Digital Research; Unix of Bell Laboratories Trademarks: MS-DOS of Microsoft, Inc.

TELECOM BRIEFS

Phil Hirsch
CW Washington Bureau

FCC stands by ruling on separate subsidiaries

WASHINGTON, D.C. — The divested Bell operating companies continue to have the ability and the incentive to cross-subsidize their unregulated activities with revenues earned from regulated services, the Federal Communications Commission concluded early this month. As a result, it said, any divested Bell operating company marketing terminal equipment and/or computer-based enhanced communications services must do so through a separate subsidiary.

WELCOME TO THE COMPUTER SHOW
LAS VEGAS COMPUTER CO.
BONE

The commission's statement represents its latest pronouncement in the continuing battle between AT&T and the divested operating companies on one hand and, on the other, a diverse group of competitors that includes value-added carriers and manufacturers of intelligent terminals. Although the battle can be traced back to the FCC's Second Computer Inquiry decision — issued four years ago — the latest round dates from last November when the commission made a modified version of the Computer Decision II separate-subsidiary provision mandatory for the divested operating companies after divestiture.

The chief modification was that the carriers were given until June 30 to set up their separate subsidiaries.

Shortly after that decision was issued, the divested operating companies asked for reconsideration. Last month, the commission rejected their requests.

One key issue in this battle is whether erasing the separate subsidiary requirement will lead to lower prices for communications services, which the divested operating companies insist will happen. Several have announced plans to offer packet-switched services that allegedly will cut costs drastically for many private-line users. However, since packet switching is an enhanced service, it must be offered through a separate subsidiary, unless a waiver is first obtained from the FCC.

The carriers insist that this arrangement is administratively impractical and that offering packet-switched services through a separate subsidiary is uneconomical. Nevertheless, several divested operating companies have submitted waiver petitions to the commission, which is expected to act on them shortly.

FCC begins investigation into AT&T regulation

WASHINGTON, D.C. — AT&T received some encouragement early this month in its continuing effort to get out from under the Federal Communications Commission's control.

As a result of divestiture, the commission has begun an inquiry into whether and how AT&T should be regulated. Among those submitting comments this month was the National Telecommunications and Information Administration (NTIA), the president's chief telecommunications adviser, which pointed out that "the last vestiges of important entry barriers may well be removed with the arrival of equal access [later this year]."

NTIA added that some current regulations "do not conform with current market realities and can be substantially revised." It recommended that the FCC propose ways to streamline its present facilities authorization procedures.

"There do not appear to be significant benefits to be gained from continuing to fully regulate AT&T under the facilities authorization process of Section 214 of the Communication Act," the Department of Defense added.

But the Independent Data Communications Manufacturers Association (IDCMA), which represents terminal makers who compete with AT&T Technologies, AT&T's equipment manufacturing affiliate, argued that the FCC's present facilities authorization procedures will be needed for some time to protect the public against AT&T. The reason: AT&T, despite divestiture, retains a market monopoly, the IDCMA said.

As evidence, it said that volume users, along with competing carriers, are still dependent on AT&T for facilities. IDCMA also said that:

- ■ AT&T's installed terminal base gives it an advantage in selling replacements and enhancements.
- ■ "Because . . . virtually every private network includes at last some AT&T facilities," AT&T "continues to control standards. [It] can change the standards or manipulate the timing of such changes . . . in ways that . . . advantage its affiliates' products and disadvantage . . . its competitors."
- ■ AT&T "has exclusive ownership of a huge patent portfolio."
- ■ The Modified Final Judgment settling the federal government's antitrust case against AT&T "expressly contemplates [divested operating company] reliance on Western Electric [now part of AT&T Technologies] and [Bell Laboratories] through 1987."

Half the money you spend on software testing is wasted.

We can show you which half!

AID's *Testing Management Handbook* contains everything you need to establish an effective and structured software testing program.

This comprehensive methodology shows you how to catch more defects, catch them earlier, and dramatically cut the time and money you spend on testing.

It's compatible with your existing application development methodology and adaptable to *new development* projects, *maintenance* activities, and *package installations.*

For information on AID's *Testing Management Handbook* or independent testing services, send the coupon. Or call Pete Wilson at 312/654-3030.

Show me how AID's *Testing Management Handbook* can improve my software quality while reducing my testing costs.

Name/Title__________

Company__________

Address__________

City/State/ZIP__________

Area Code/Phone (____)__________

AID

Applied Information
Development, Inc.
823 Commerce Drive,
Oak Brook, IL 60521

X.25 for DEC

THE ALTERNATIVE TO HOST COMMUNICATION SOFTWARE

ACC's communication processors connect VAX, PDP-11, and LSI-11 computers to X.25 networks — Telenet, Tymnet, Uninet, and other public or private data networks. Discover the ACC alternative.
Call ACC today.

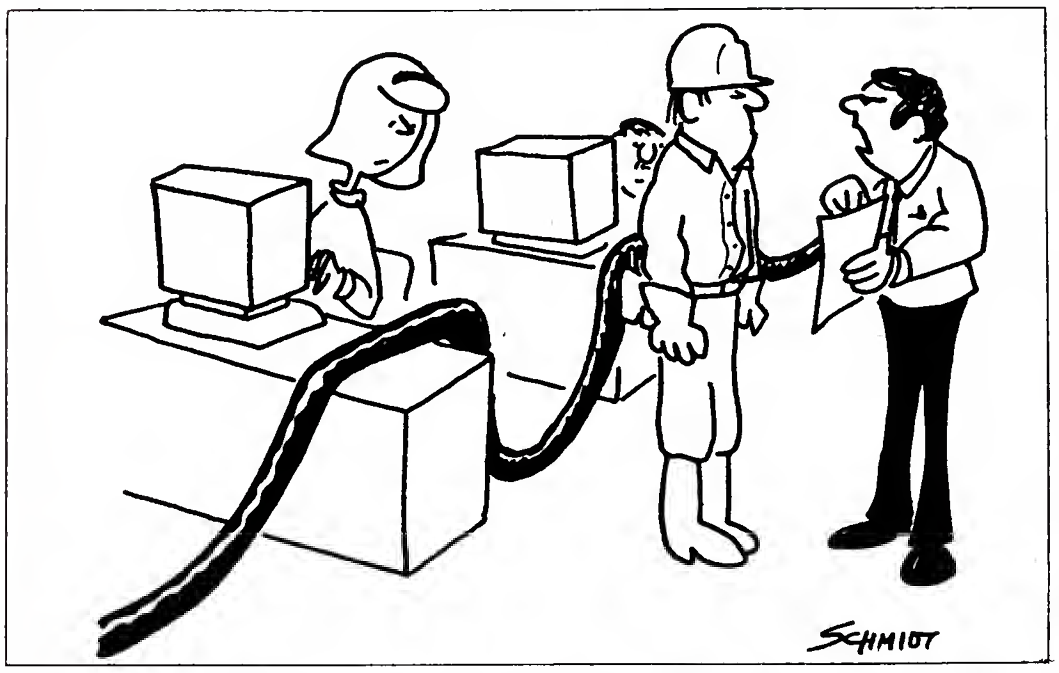
(805)963-9431

720 Santa Barbara Street
Santa Barbara, CA 93101
TWX 910 334-4907

ACC

Advanced Computer Communications

ACC is a trademark of Advanced Computer Communications. DEC, PDP and VAX are trademarks of Digital Equipment Corp. Tymnet is a trademark of Tymnet, Inc.



'Our contract very cleary calls for you to install the cable under the floor!'

File retrieval system cuts report generation time

BRAINTREE, Mass. — Last year the DP shop at Haemonetics Corp. here found that managers in production, materials and quality control had taxed the capabilities of the shop's IBM System/38 Model 7 to the limit.

The manufacturer of disposable plastic components used to separate blood in hospital operating rooms was losing 30% to 50% of its programming time generating one-time reports for different manufacturing and business managers, according to Tom Snyder, MIS manager.

Snyder felt the company needed a data file retrieval system that would speed this process, so in July 1983 it began shopping for appropriate software. The company settled on Fusion/4 Media-Independent Information Retrieval System from Fusion Products International in Larkspur, Calif.

Snyder said Fusion/4 was selected because "we were looking for user-friendly software to allow people to go in and do their own thing and not take up programmers' time that could be spent on more complex applications." Fusion/4 did not require extensive technical background to be used, he added.

Haemonetics runs eight or more IBM application programs for the System/38, which has 1M byte of main memory. All the support programs were linked to the Fusion/4 retrieval system by one technical support person, Snyder said. Haemonetics has 50 terminals tied into its main System/38, for an average of 2½ persons per terminal. The company has three System/38s in the U.S. and three System/34s in Europe, where the company uses Fusion/3 retrieval software.

A total of 25 nontechnical managers and their support personnel were taught how to retrieve System/38 data and log files.

Independent users

"Because it was new, when people began using it, we had some questions," according to Snyder. "But after a short while, the users became very independent."

Snyder said that programmers now seldom get involved in one-time special reports. Fusion/4 gives its users access to data bases for making customized reports for company applications.

"This leaves the programmers free to work on long-term projects and avoid the fire fighting connected with generating one-time reports," Snyder said.

Furthermore, Snyder added, Fusion/4 can be used to check information in the System/38 data base for test-writing a report. Test-written reports can be shown to the person requesting a formal report, then reviewed for confirmation of all fields before computer time is spent writing the formal report, he said.

Increasing awareness

"One key benefit of the Fusion/4 system is that it is helping our business and production managers become more aware of what our systems staff has to do to develop a report.

"The managers are now starting to think their requests for computer reports through more thoroughly," Snyder said.

Snyder also believes Fusion/4 saved the company from having to hire additional programmers. "Just one more programmer would have increased our systems operating cost by a factor of six or seven times," he said.

Snyder added that Haemonetics was able to recapture the cost of its Fusion/4 system in only 3½ months of programmer time.

He was waiting on his leased line.

If you're dying to get a leased line on-line, or you're scared to death of the cost, then Control Concepts offers a solution that can help keep your business alive and well.

The Control Concepts 3270 compatible terminals come with a choice of integrated modems, including a new 4800 Baud integrated modem that is Bell 208 A/B compatible and allows you to use a modular RJ11 telephone jack. And it's just as easy to get up and running as our other 3270 compatible terminals including the model with the integrated 2400 Baud Modem.

The Control Concepts terminals can also be ordered in BSC or SNA/SDLC, giving you a complete range of 3270 choices.

For more information, or A Free 30 Day Trial, call 1-800-368-3078 (in Virginia, call 703-361-5545), or write to: Control Concepts, P.O. Box 2367, Manassas, Virginia 22110.

You'll find the cost much easier to live with.

CONTROL CONCEPTS
A DIVISION OF PRESEARCH INCORPORATED

Florida school system gives mini network high marks

Net links schools to central data base, cuts administrative time, costs

FORT LAUDERDALE, Fla. — Officials of the Broward County school board here realized in the late 1970s that they were running out of DP capacity at their central computing facility. The realization came at the same time the board was encouraging schools within the county to create and develop programs to meet their individual needs.

Broward County is the nation's 10th largest school district; it serves 127,000 students through 158 school locations. The district's decentralized school-based management gave principals a great deal of responsibility — they are responsible for such things as curriculum selection, staffing and budget development, tasks often done in central offices in other schools — but created a record keeping problem at each school.

"It is virtually impossible for such a school management system to coexist with centralized data processing," stated Fred Kauffman, director of MIS for the Broward County school board.

"We knew there would have to be a major change if we wanted to maintain central control of data and still have each principal run an individual operation. We had to give the principal some local data processing capability."

Board's DP components

Broward County's existing data processing facilities consist of two IBM Model 4341 Group II processors with several peripherals, including disks, tapes and punch card equipment. Data from each school, such as attendance records, had to be hand-carried to the central site for processing. The schools had no direct means of interacting with the computer and no quick ways of discovering errors in their data collection procedures.

"The mainframe computer was handling the districtwide data processing needs of the school board, but proved insufficient for the data processing needs of individual schools," Kauffman recalled. Faced with strong centralized and decentralized data processing needs, the school board selected an approach that would accomplish two primary goals:

- ■ Provide record keeping and administrative help to school principals.
- ■ Provide a modern DP system with a future growth path for the entire Broward school district.

The approach adopted was to install a minicomputer and scanner in each school. This network of minicomputers would be linked to the central computer facilities so that data from the schools could be electronically collected.

When a team of Fort Lauderdale computer professionals and Kauffman's staff reviewed several proposals, they selected a Northern Telecom, Inc. Model 585 Office Information System. The installation involved equipping each of the 158 school locations and 12 administrative offices with a minicomputer and scanner.

Site configurations

The various site configurations range from four terminals and two printers in the high schools to two terminals and one printer in the elementary schools. The central site contains two host minis connected to the communications facility to handle file-to-file transfers with the remote minis and the IBM mainframe.

Data entered at each school is transmitted automatically to the host each night. That data is passed to the mainframe via tape, then used to update the central student data base. The edit/audit reports are passed to the host Northern Telecom Model 585s by tape and subsequently sent to each remote system via the communications facility.

The secondary school remote locations are also connected directly to the IBM mainframe for access to the central data base.

The system has enabled the district to phase out all the keypunchers and sorters in the schools and operate in a cardless environment. The cost savings as a result are said to average $130,000 per year.

"The system has also cut record keeping activity in half," Kauffman said.

Another time saver was the installation of scanners in each school, which were connected on-line to their respective local minicomputers. These scanners are used to read students' tests, which are then processed by a program called Answer.

Long-term plans for the Broward distributed data processing system include using the Model 585 to run each school's business, to connect them to Apple Computer, Inc. systems as courseware sources, to connect the district's cash registers and to incorporate the electronic transfer of student records.

ICCP names executive director

CHICAGO — George R. Eggert has been named executive director of the Institute for Certification of Computer Professionals (ICCP) here.

Eggert was formerly the director of the Chicago Office of Planning and Management for the U.S. Department of Defense's Contract Administration Services Region. He retired from that post on April 27, culminating 40 years of federal service.

Long active in the field of information privacy, computer crime and ethics, Eggert has served on the advisory council of the Information Privacy Research Center at Purdue University and is a member of the editorial advisory board of *Information Privacy* magazine in the UK.

In his new capacity, Eggert will manage the ICCP's operations and development, reporting to the ICCP executive committee.

The Chicago-based institute is a nonprofit umbrella organization established by eight national and international computer societies in 1973 to test and certify the knowledge and experience of computer and information systems personnel.

Self-Study Tape Cassette Course

Introduction to
UNIX-based Systems
by
Dr. Stephen Blaha (formerly of Bell Labs)

CONTENTS:
- Comparison of UNIX-based Systems: Xenix, PC/IX, Berkeley UNIX, System III, Ultrix 32,...
- Overview of Capabilities: Data Processing, Office Automation, Financial Analysis,...
- Detailed Introduction to C and Bourne Shells
- Detailed Survey of Commands and Utilities
- Overview of UNIX trends

$149

Mail to: **Blaha Software Inc.,** Suite 803, 50 Commonwealth Avenue, Boston, MA 02116 (Mass. residents add 5% sales tax).
(617) 262-4183

Name ______________ Amt. Enclosed ______
Company/Street ______________
City/State/Zip ______________

X.25 for DEC

TO OFFLOAD PROTOCOL PROCESSING

ACC handles X.25 protocol through ISO level 3 in its front-end processor which frees your DEC host for valuable applications processing.
Add network access without impact to performance.
Call ACC today.

(805)963-9431

720 Santa Barbara Street
Santa Barbara, CA 93101
TWX 910 334-4907

ACC
Advanced Computer Communications

ACC is a trademark of Advanced Computer Communications. DEC is a trademark of Digital Equipment Corp.

Micro tools trim report costs for American Express

NEW YORK — In an effort to control the rising volume and cost of user-generated reports, the personnel and data processing departments here at American Express Co. two years ago began reviewing the company's mainframe Human Resource System (HRS) to determine if a more user-friendly, cost-effective package could be found.

"Our department was being charged $25 to $100 for each report we needed," recalled Claire Lichack, manager for American Express' HRS.

While the review found several powerful, easy-to-learn packages, American Express determined that the existing package, from Information Science, Inc.'s Human Resource System, was best able to produce the reports that the personnel department needed. Rather than replace the mainframe package, the review recommended that American Express use microcomputer programs to supplement the mainframe package.

The first steps in this project were taken in January 1983, as the corporate HRS department began to determine how the personnel department could use microcomputers. The personnel function at American Express is decentralized, and 10 additional offices access the personnel system. The HRS department acts as the liaison between the DP department and the other groups.

Initial issues in implementing microcomputers consisted of the selection of hardware to access the IBM 3083 mainframe, selection of software to manipulate personnel data, the feasibility of downloading IBM mainframe data, the impact of micros on data security and data validity and cost considerations.

From the start of the project, security was a major concern. Although dial-up access is convenient and allows users to work away from the office, it requires expensive dial-back security systems to control access. Plus, dial-up access was not able to control authorized system access.

American Express decided to use a direct cable connection to the company's IBM Synchronous Data Link Control (SDLC) network to download data. IBM microcomputers supported this network; Apple's product did not support it. This was one of several reasons why American Express chose the IBM Personal Computer over the Apple product.

Available software was another consideration. American Express had determined that it needed a package that could support field, record and file sizes required for various applications; read downloaded files easily; produce graphics; create a wide range of report formats; perform calculations and statistical analysis; be learned quickly and easily; interface with other microcomputer software packages; and combine data from several files into a single report. Additional but not mandatory features included built-in security features and better-than-average documentation and vendor support.

Information Builders, Inc.'s Focus was one of the mainframe packages that the committee had initially evaluated. Although the package met all user requirements, it needed extensive resources to create long, detailed reports. For production cost reasons, mainframe Focus was not a viable alternative. However, Information Builders' PC Focus did eliminate these problems, and so it was chosen as the primary application package.

Once the package was chosen, a communications capability had to be established. American Express was not sure that HRS files could be downloaded to PC Focus with American Express' existing microcomputer-to-mainframe link — Technical Analysis Corp.'s 3278 emulation package called Irma. A test file was successfully moved from the mainframe to the microcomputer.

A plan was then developed to provide users with HRS data by the first quarter of 1984. The steps included determining file layout and size requirements for each user, identifying hardware requirements, creating and testing the downloaded files, training users in PC Focus, providing support for both report generation and new application development and conducting demonstrations of PC Focus for the personnel end users.

Security a major concern

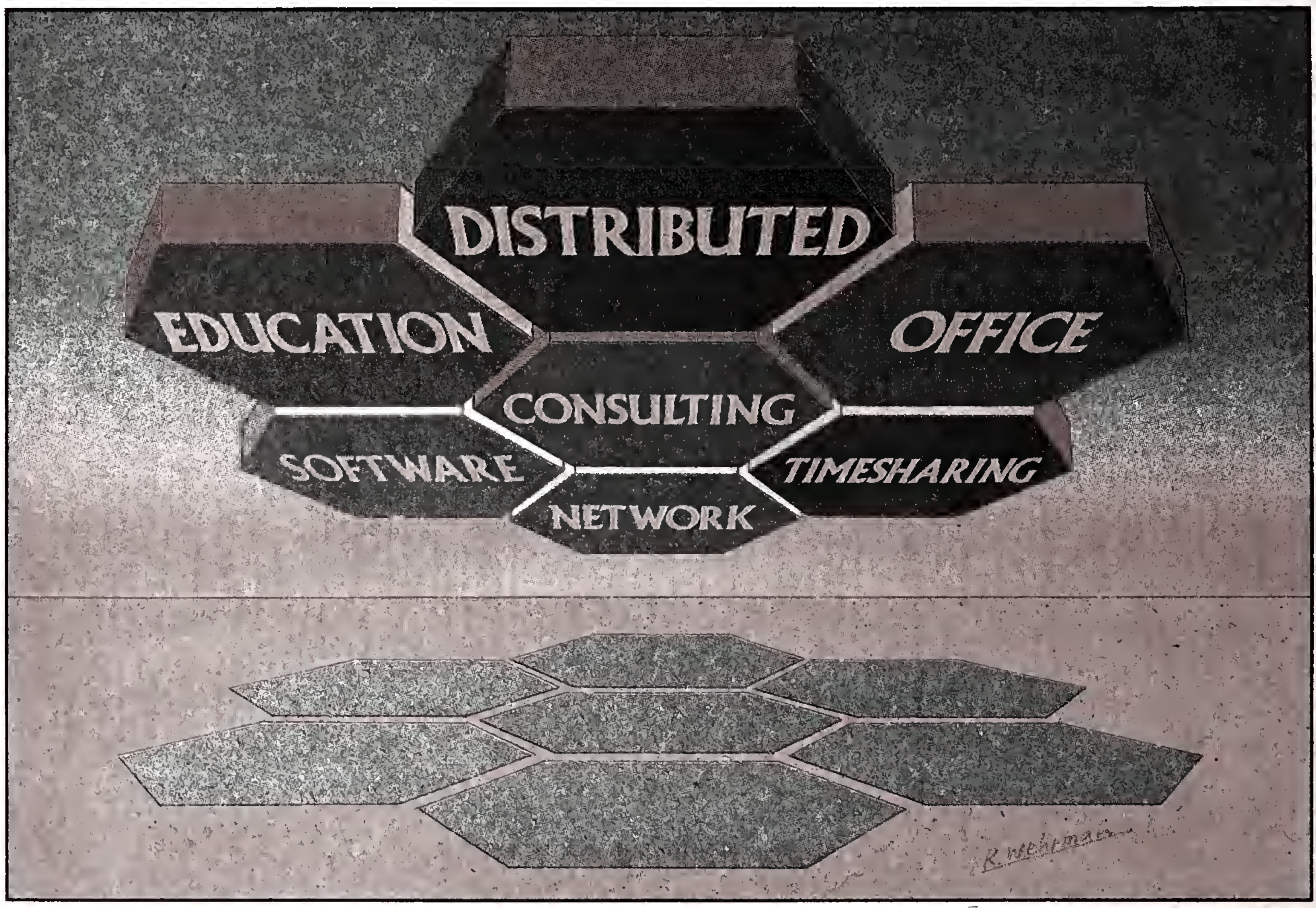
Early in 1984, the training strategy was completed. Since security is a major concern, American Express developed a user security awareness seminar using its Corporate Security Services Group. The goal of the program is to provide the end user with methods of dealing with security responsibility.

American Express had initially projected a small number of potential PC Focus users. However, during February, Information Builders added a feature to PC Focus that allows users to create reports without using PC Focus coding. This code generator, Tabletalk, is menu-driven and may result in a larger number of personnel users of PC Focus.

Today, American Express uses PC Focus to create both reports and specialized personnel applications.

"Using PC Focus, users can write reports that used to cost $25 to $100," Lichack said.

Meeting all your information needs requires total systems integration knowledge and experience.



Meeting information needs has become a major international concern. One in which maintaining compatibility and unity is a difficult task. That's why Boeing Computer Services offers a unique combination of integrated information services to government and industry. To help you obtain precisely the systems, services and software you need.

For example, we design, implement and maintain large-scale communications networks — integrating the best technology without hardware bias. Our Office Information Services can help you at any stage in the office automation process. With all-new or existing equipment.

We've also enhanced our MAINSTREAM® teleprocessing network to offer you today's leading operating systems and programming languages. No other remote computing firm gives you as many valuable options.

And we're linking microcomputers to our MAINSTREAM service in exciting new ways: workstations involving the IBM® PC/PC XT and XT/370, combined with our EIS® business management software. And our DP8410 Micro Workstation for structural engineers.

Finally, we provide a full range of Software Solutions. Complete Education & Training. And a variety of Professional Support Services.

In each area, Boeing offers you integrated solutions, designed to harmonize with your overall operation. For more information or the location of the sales office nearest you, call toll-free **800-447-4700.**

Or write BOEING COMPUTER SERVICES, M.S. CV-26-11B,
7980 Gallows Court, Vienna,
Va 22180.

BOEING COMPUTER SERVICES A Division of The Boeing Company

MAINSTREAM and EIS are registered service marks of The Boeing Company • IBM is a registered trademark of International Business Machines.

French net highest DP salaries in four-nation study

English, Belgian, Spanish computer salaries lag behind financially after taxes

By Jo Cohen
Special to CW‡

	Gross salaries in U.S. dollars				Net salaries after social security/ insurance and direct taxes in U.S. dollars			
	France	Belgium	England	Spain	France	Belgium	England	Spain
Computer manager	$41,096	$42,214	$31,426	$26,519	$29,051	$19,769	$20,925	$20,446
Director of Operations	26,157	29,698	21,930	16,701	20,028	15,814	14,966	13,682
Systems engineer	23,636	23,667	21,656	17,629	18,288	13,355	14,776	14,237
Project manager	22,980	22,410	19,666	16,780	17,833	12,790	13,382	13,740
Maintenance analyst	20,012	22,701	17,943	14,080	15,745	12,917	12,260	11,733
Programmer analyst	15,638	18,201	13,215	9,727	12,750	11,040	9,294	8,419
Operator	14,625	16,106	15,207	10,151	11,938	10,111	10,508	8,720

Salary comparisons of computer experts in France, Belgium, England, Spain

PARIS — How much is a computer expert worth?

A comparison of salaries in France, Belgium, England and Spain indicates that the big winners are the French.

A research group here called Sema Selection analyzed the gross salaries of Belgian, French, Spanish and English computer workers and ascertained that the highest paid people in almost all positions are the Belgians, followed closely by the French, while the English and Spanish compensations trail far behind.

However, when the salaries are compared after social security/insurance and direct taxes, the French come out ahead in all positions, followed at a distance by the English, the Belgians and the Spanish (see chart).

It is difficult to distinguish which of the latter three countries is the best place to work, because while the Spanish DP manager makes more money than his Belgian counterpart, the situation turns around for the director of operations and so forth. Moreover, in consolidating the average salaries allotted to different positions, one obtains very similar amounts in the three countries. The social security/insurance and taxes on the income are particularly hard on the Belgians and, to a lesser extent, the English.

Generally, salaries are arranged in a hierarchy moving down from the jobs at the heart of the company's computer operations. Computer managers are better paid than the director of operations, while the latter draws a higher salary than the project manager, and so forth.

There are certain exceptions to this rule, however, as the importance of one job is not exactly the same in the four countries analyzed.

In Spain and England, the computer operator makes more money than the programmer/analyst, while in France and Belgium the opposite is true.

The Belgian maintenance analyst earns higher wages than the project manager, contrary to the earning power of his three European counterparts.

In comparison, a Belgian maintenance analyst salary represents 65.3% of that of a computer manager in his country, whereas the French, English and Spanish maintenance analysts earn 54.2%, 58.6% and 57.5%, respectively, of their country's computer managers' salaries.

Likewise, systems engineers take the lead over the director of operations in Spain, which is not true in France and even less true in Belgium, where the systems engineer is paid less than the director of operations.

The latter, moreover, seems to have a privileged position in Belgium, since he earns more than 80% of a computer manager's salary in his own country. In France, England and Spain, the director of operations earns 69%, 71% and 67%, respectively, more than a computer manager in his own country.

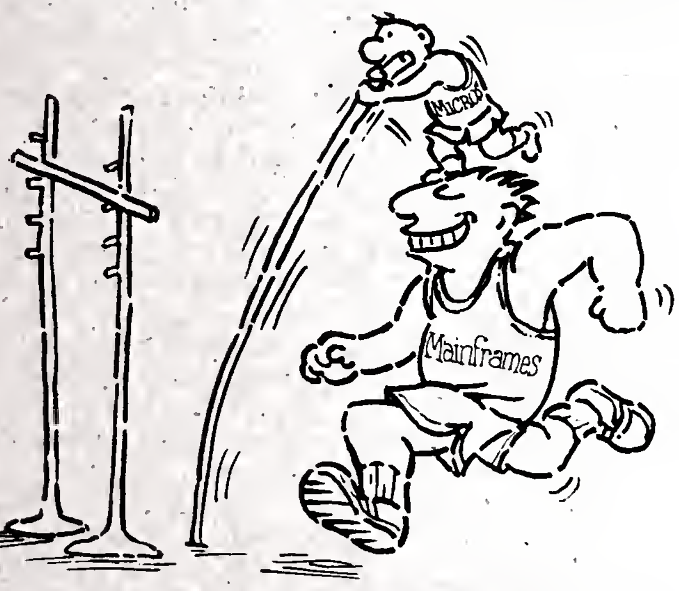
Systems engineers in France, Belgium, England and Spain earn 63%, 67.6%, 70.6% and 69.6%, respectively, of computer managers' salaries in their own countries.

An analysis of relative salaries after taxes and other deductions indicates that French DP professionals end up with the lion's share.

Thus, if the French computer manager has a net salary which represents 70% of his gross salary, the Belgian, English and Spanish computer managers only get 48%, 51% and 50%, respectively, of the gross salary of the French after taxes and social security/insurance. On the other hand, while they garner the highest salaries after taxes, French DPers do not necessarily enjoy the most buying power, the survey noted.

Cohen is the News Editor of Le Monde Informatique, *the French affiliate of* Computerworld, *in which this article originally appeared. The story was made available via the CW International News Network.*

Micro vs. Mainframe Spreadsheets?



Competition or Cooperation?
. . .it depends on your point of view.

DYNAPLAN™ has provided over 300 CMS and TSO users with the ability to exchange data (upload, download, consolidate) among VisiCalc,* Supercalc,* Lotus 1-2-3* and CMS/Dynaplan or TSO/Dynaplan.

DYNAPLAN™ also provides external file access to corporate data – plus integrated color graphics.

FOR A FREE
30 DAY TRIAL CALL:
(312) 525-6400

—ChicagoSoft

738 N. LaSalle St.
Suite 2
Chicago, IL 60610

Dynaplan is a trademark of Dynosoft Corporation. VisiCalc is a registered trademark of VisiCorp. 1-2-3 is a registered trademark of the Lotus Corporation. Supercalc is a registered trademark of Sorcim Corporation.

X.25 for DEC

WITH TERMINAL & HOST SUPPORT.

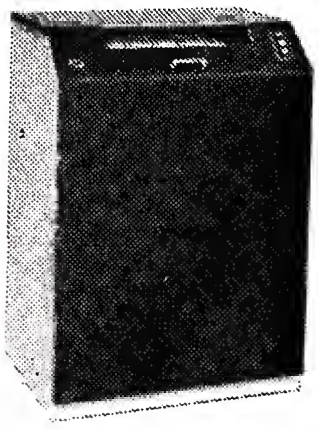
ACC provides full screen editing support for remote and local terminals needing access to DEC hosts through X.25 networks.
ACC can also provide host to host file transfer across X.25 networks.
Call ACC today.

(805)963-9431

720 Santa Barbara Street
Santa Barbara, CA 93101
TWX 910 334-4907

ACC Advanced Computer Communications

ACC is a trademark of Advanced Computer Communications DEC is a trademark of Digital Equipment Corp



Innovator 300 LPM Printer System

Now! Compatible with nearly any micro, mini, and mainframe.

The Innovator printer system can interface with your IBM, Burroughs, DEC, RS-232 Serial and many additional communication protocols. Also, the highly reliable, field proven Teletype™ mechanism provides years of virtually maintenance free performance, significantly lowering your cost of ownership. Starting at...... $4,995

FEATURES:
- Impact printer with fully formed characters
- Ultra quiet acoustically damped cabinet
- BSC/SNA compatibility
- 132, 80 column, heavy-duty print mechanism
- Low cost nationwide service

NEW! IBM 3270 COAX

Innovative™

(305) 624-1644
1-800-327-3955

INNOVATIVE ELECTRONICS, INC., 4714 N.W. 165th Street, Miami, FL 33014

IBM offers new proposals to EEC in attempt to end antitrust case

LONDON — IBM has reportedly offered the European Economic Commission (EEC) two new proposals in an attempt to end the long-running European antitrust case brought against the company.

News of the proposals broke during a recent address by IBM Chairman John Opel to the American Chamber of Commerce in London. However, he did not supply details on the proposals except to say that "We're currently involved in discussions with the commission, and we have made new proposals which we think should satisfy their requirements. The full commission, as we undertand it, has not yet taken any decision."

The EEC rejected IBM's former proposals back in April and also claimed to be nearing a final ruling on the case. Industry watchers suspect that the latest IBM move may just be a smoke screen to keep the EEC from ruling.

Opel also used the opportunity of his speech to take a shot at the EEC for its actions and criticisms against IBM: "All of you who are in industry should feel concerned . . . because this kind of action could be taken against the leader of any industry."

The EEC's antitrust allegations stem largely from IBM's corporate policy of not revealing technical details about new products, effectively preventing IBM plug-compatible manufacturers from competing against Big Blue in a market where they enjoy the "dominant position," according to the EEC.

Meanwhile, IBM argues that it is unreasonable for the company to disclose the findings of its research and its product specifications early enough to allow its competition enough time to market a similar product.

Chinese plan IBM-type micro

SINGAPORE — A Singapore company has established a 50-50 joint venture with a Chinese organization to manufacture an IBM-compatible "Third-World micro" in China.

Lityan Development has partnered with the Guangzhou Audio and Electric Appliance Factory of China, which has set up shop to produce the machines. The systems will be based on the Intel Corp. 8088 chip with a minimum of 256K bytes of main memory.

Half of the output — anticipated to top 1,000 units in the first year — will be sold in the People's Republic of China, and the remainder will be exported. "We have parties in Southeast Asia who are interested and have even had interest from Africa," said S.K. Ong, Lityan joint venture managing director. "We feel this [system] will be suitable for them."

Ong belives the product has the potential to become *the* "Third-World micro."

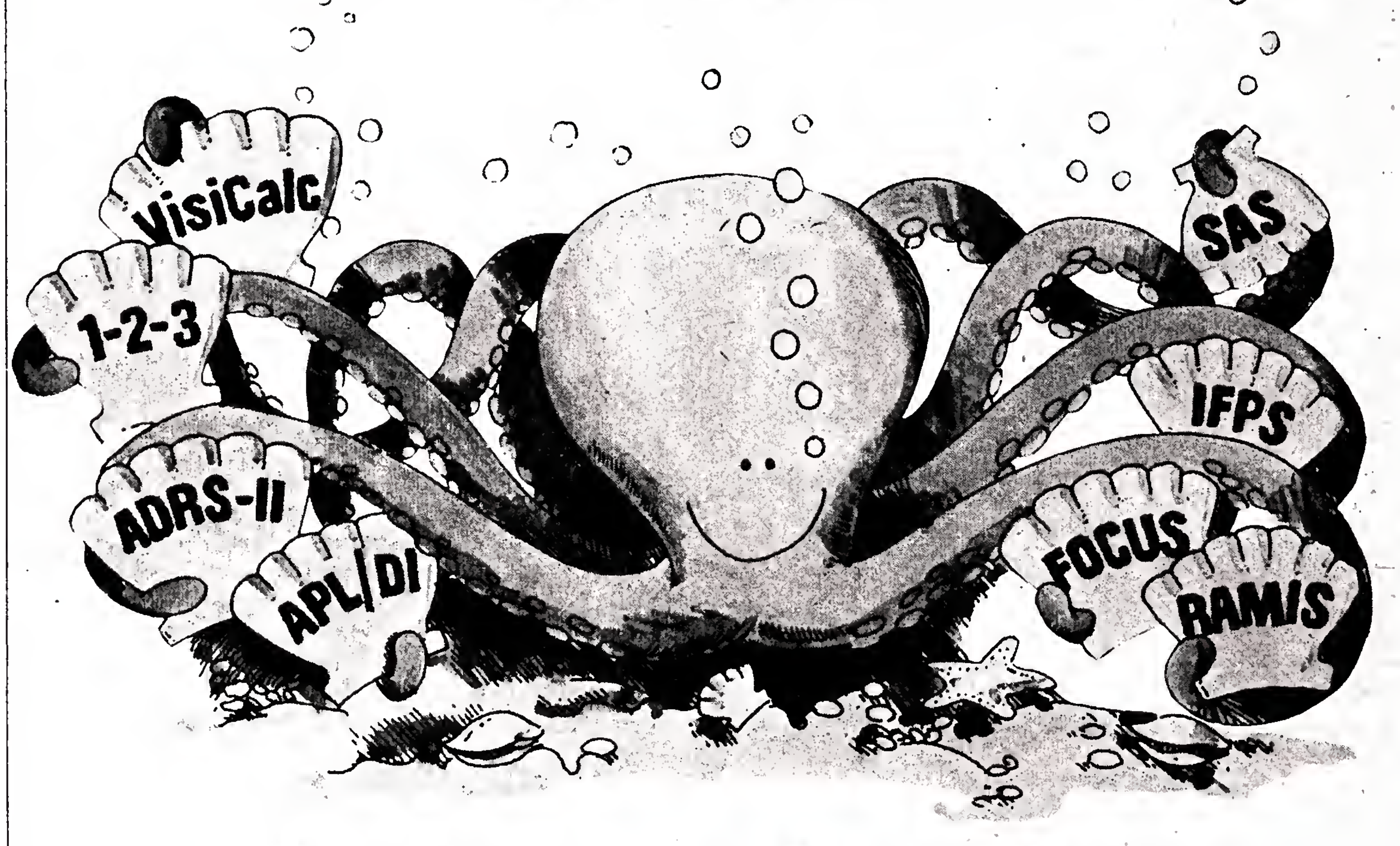
The initial agreement spans five years, and sales are projected at $40 million. Individual units are expected to cost approximately $7,500.

The joint venture spokesman predicted a five-year evolution of the Third-World micro, taking it from a double-sided, double-density dual floppy disk version to a floppy disk/hard disk IBM Personal Computer XT-type machine.

Applications within China would be mainly for distribution and stock control in connection with the manufacturing sector. Systems with telex and networking capabilities are also on the drawing board, he added.

This story was made available via the CW International News Network.

MEET DATAPORT.™



THE VITAL CONNECTION IN YOUR INFORMATION CENTER.

Imagine the potential of an Information Center tool that lets even the most novice of users work with data and send it back and forth among leading micro and mainframe products.

STSC's DATAPORT product is that tool. With this versatile display and analysis product in your Information Center, there is virtually no piece of data beyond reach. DATAPORT's interfaces connect you to popular products like FOCUS®, RAMIS®, IFPS®, SAS®, ADRS-II, APL/DI, VisiCalc®, and LOTUS's 1-2-3™

To top it off, DATAPORT is a stand-alone, full-screen entry, display, and analysis system. Its file-folder concept allows users to work with tabular data like budgets or sales forecasts and text data like memos, instructions, or reports. The DATAPORT product also provides powerful calculation routines, highlighting, report formatting, and even works with multi-dimensional data.

Most important, DATAPORT was designed from the very beginning for the wide range of users in the Information Center environment. A unique combination of menu and command-driven technology provides a level of friendliness that satisfies the needs of both expert and novice users.

See for yourself how the DATAPORT product can be the vital link in your Information Center. For a free demonstration, write or call Margaret Tanzosh, STSC, Inc., 2115 East Jefferson Street, Rockville, Maryland 20852. (301)984-5000.

STSC
A Contel Company

STSC, Inc., 2115 East Jefferson Street, Rockville, Maryland 20852
Attention: Margaret Tanzosh

☐ Please send more information on STSC's DATAPORT product.

☐ I'd like to schedule a DATAPORT demo. Please call to set a date.

Name ____________ Title ____________
Company ____________
Address ____________
Phone (   ) ____________

DATAPORT is a trademark of XNUM Corporation. FOCUS, SAS, IFPS, and VisiCalc are registered trademarks of Information Builders, Inc., SAS Institute, Inc., Execucom Systems Corporation, and VisiCorp respectively. RAMIS is a registered service mark of Mathematica, Inc. 1-2-3 is a trademark of LOTUS Development Corporation.

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

CANBERRA — After six months of turmoil in the computer industry, the government here has handed down a decision that will give certain types of computer software protection under the Copyright Act.

Full details of the legislation will not be available until the bill is passed by Parliament, but government officials indicated that software would soon be defined as a literary work.

The bill takes the form of an amendment to the Copyright Act and includes a fairly comprehensive definition of a computer program, sources said.

It reportedly grants protection to both source and object code in their own right and extends this to include code whether in a paper or computer readable form.

The amendment reportedly removes the requirement for a visible work and includes changes to the definition of infringing copy to cover chips.

It is not known whether the legislation will be retroactive, sources said.

■

BRISBANE — BHP Co. Ltd. has decided to get its IBM Personal Computer peripherals directly from U.S. distributors, rather than wait for those in Australia to supply them.

BHP's personal computer coordinator, Lloyd Borrett, said U.S. suppliers offer cheaper hardware and software and faster updates.

CHINA

BEIJING — Intel Corp. has signed an agreement with China's Aeronautics Import and Export Corp. to provide components and kits comprised of Intel's 8086- and 8088-based single-board microprocessors and 16-bit microcomputers.

The $11 million agreement requires Intel to train and document the components for assembly and testing in China.

DENMARK

COPENHAGEN — IBM has signed a two-pronged agreement with Copenhagen Telephone Corp. (KTAS) that calls for KTAS to market and support IBM Personal Computers.

KTAS is a government-franchised telephone operating company and equipment supplier with a monopoly on telephone and network services here.

FRANCE

ANGERS — French President Francois Mitterand visited the Bull Sems factory here to see the 1,000th DPS 7 system come off the assembly line.

The Bull factory, in conjunction with Honeywell, Inc., provides the DPS 7 and other mid-range mainframes to the European and American markets. The 1,000th system went to a West German computer user in the city of Hannover.

JAPAN

TOKYO — Toshiba Corp. has unveiled a series of graphics processors called Tospix II. The microprocessor-based systems are equipped with 512K bytes of memory and can reportedly produce images at 1 dot per 120 nsec — eight times faster than existing image processors.

The Tospix II line will be available in June, according to the vendor; units will range in price from $20,000 to $60,000.

NETHERLANDS

AMSTERDAM — Expenditures on computers and related equipment in the Netherlands and Belgium total about $2.7 billion a year, according to Hubert Van Onna, managing director of IDC Benelux, an Amsterdam-based subsidiary of International Data Corp.

Belgium and the Netherlands import roughly 50% of their DP equipment, IDC said, and DP expenditures average $177/person in the Netherlands and $155/person in Belgium.

See **DIGEST** page 36

Computer Interruptus

Midnight. And you wish you would be left in the dark. But miles away in the DP Department, a misplaced DD override, an invalid concatenation, or some other equally obscure JCL error brought production to a standstill.

And when the system breaks down, it's you or your staff they call up. Which usually means getting up and getting down there. And after a night like that, how productive will the morning be?

What a waste. If you had the JCLCHECK™ program, you wouldn't have JCL errors, period. None. Zilch. Zero.

Because the JCLCHECK program can catch any and all JCL errors and give you complete, on-line JCL validation and concise error diagnostics. Plus complete documentation on a job stream or entire production system suitable for insertion in the run book. And it can operate under TSO, TONE, ROSCOE or CMS.

Imagine, with no more JCL errors, your programmers can finally concentrate on what you hired them for: writing programs.

So what are you waiting for? Send the coupon or call us at (408) 554-8121 for details. We'll show you how the JCLCHECK program can bring your error detection out of the dark ages, increase production, and eliminate applications backlog. And that'll put you in the spotlight.

I'm frustrated and tired of JCL errors.
☐ Send me details on the JCLCHECK program.
☐ Have a representative call me.

NAME ____________________
TITLE ____________________
COMPANY ____________________
ADDRESS ____________________
CITY, STATE, ZIP ____________________
PHONE ____________________
OPERATING SYSTEM ____________________

Triangle Software Company
4340 Stevens Creek Blvd., Suite 108
San Jose, CA 95129

© Copyright Triangle Software Company. JCLCHECK is a trademark of Triangle Software Company.

MANAGERS ON THE MOVE

ROBERT HERNANDEZ JR. has been named vice-president and data processing director, and ROLAND LAFERRIERE has been named vice-president and information services director, for Zayre Corp. in Framingham, Mass.

In his 10 years with Zayre, Hernandez has served in several management positions in the systems and technical services division, including assistant vice-president and manager of data processing, manager of MIS operations and technical services manager.

He graduated from Central State University in Edmond, Okla., and holds an M.S. from Worcester (Mass.) Polytechnic Institute.

Since joining Zayre in 1974, Laferriere has served as assistant vice-president and manager of distributed information systems, manager of systems development and store systems manager.

Laferriere holds a B.S. from Southeastern Massachusetts University.

■

JERRY SIMPSON was recently named director of the newly created Computer Services Division for the Southwest Florida Water Management District.

Simpson will guide the development of a new Sperry Corp. system the district installed last year and provide processing support for all water resource data, permitting, finances and budgeting.

Simpson was formerly the assistant superintendent of MIS for Fairfax County, Va., public schools.

He is a graduate of the University of Florida and received his master's degree in computer science from the American University in Washington, D.C.

■

DONALD SIMONSEN has been promoted to vice-president of resources for Ekco Products, Inc. in Wheeling, Ill.

Simonsen will be responsible for customer service, manpower, purchasing, information systems and physical distribution material.

He has been with Ekco for 20 years in various management positions.

Simonsen is a graduate of Wright Junior College and has attended Columbia College and Industrial Engineering College.

DIGEST

from page 35

According to IDC, total DP spending in Western Europe is $32.7 billion annually.

SWEDEN

STOCKHOLM — Datatronic has entered a bid to take over the ailing Victor Technologies, Inc., in spite of previous attempts by the British microcomputer firm ACT to buy the U.S. micro maker. If the deal goes through, it will be a major step in Datatronic's attempts to establish a strong high-tech profile.

UNITED KINGDOM

LONDON — IBM is reportedly poised to offer UK businesses a nationwide data communications service. The computer giant has discussed plans for a full-fledged data communications network with a number of industries, including the travel and insurance sectors. The intention is an IBM network for message exchange in these and other business sectors, sources said.

■

SOUTHAMPTON — Quorum Computers Ltd. and Selvan Systems have jointly announced a series of multiuser accounting systems that are now available on Quorum's Q-Lan micro-networking system. The CP/M-based systems can be configured in groups of up to 64 terminals.

WEST GERMANY

PADERBORN — Heinz Nixdorf announced that stock of his company, Nixdorf Computer AG, went public on the German stock exchange on June 4, with shares priced at 380 marks (approximately $137). Nixdorf called the offering price "fair and well balanced," while German Bank AG board member Dr. Herbert Zapp predicted the shares will be in great demand.

CAN YOU FIND THE SEVEN IBMs IN THIS PICTURE?

We'll tell you where to look. Inside the CIE-7800 and CIE-7850.

The 7800 terminal is plug compatible with the IBM 3178 and all five models of the 3278 series. That accounts for six IBMs.

Now, when you add in the CIE-7850, you also get 100% IBM PC compatibility. That makes seven.

Even more remarkable, the CIE-7800 costs less than

Variety of tools handy to hone communication skills

MIS professionals take advantage of training in oral, written presentations

By Robert Batt
CW West Coast Bureau

"It takes three weeks to prepare a good ad-lib speech."

Those words of wisdom, attributed to Mark Twain, are becoming ever more relevant to a growing number of data processing professionals as they strive to explain the complexity of the information technology revolution now engulfing industry and commerce.

Managers of information systems are increasingly concerned about the need for developing effective communication skills among their high-technology specialists, according to a series of individual and telephone interviews conducted with computer users, consultants, vendors and trade associations.

"Most DP professionals find it almost painful to stand up and deliver an effective talk to their colleagues, managers and users. All too often this vital skill is left to a learn-as-you-go approach," commented Gopal Kapur, a Danville, Calif.-based computer industry consultant.

While the problems that DPers have in communicating effectively to nontechnical audiences is well documented, there is also growing evidence that a concerted effort is now being made to tackle the problem. For example:

- In response to demands by its 2,450 member firms, the American Electronics Association (AEA) recently announced a number of new courses that include workshops on how to prepare and make effective written and oral presentations, along with workshops on how to manage a working environment containing many different nationalities and cultures.
- Control Data Corp.'s Institute for Advanced Technology Division presents a three-day workshop to about 20 people at a time that is designed to enable MIS managers to become more effective negotiators.
- Kapur & Associates, Inc. has given a course on "Effective Communications Skills" to take the fear out of public speaking to such clients as Hewlett-Packard Co., Bechtel Corp., Syntex Corp. and the Federal Reserve Bank.
- Standard Oil Co. of California (Socal) is putting together a career development workshop designed to give MIS and other senior managers the tools they need to achieve the career goals they have set for themselves.

"We have a constant demand from our MIS people to take these type of courses," commented Chris Lardge, Socal's employee relations manager. "Most of them spend an awful lot of time in meetings, and they recognize the importance of being able to sell their ideas."

Added Georgyne Purcell, manager of technical management seminars at the AEA, "Communication is a creative endeavor, and senior managers have finally recognized that their people must communicate as a team if they are to increase productivity."

According to Stewart

See **SPEECH** page 38

any single one of those IBM terminals.

It's more compact, too. Over 40% smaller. But the screen is larger. By 36%.

The monitor tilts, rotates and weighs less than 20 pounds. Move it where you need it.

The detached keyboard has an 87-key IBM compatible layout. It can be user configured into any of 22 different U.S. and international keyboards.

The CIE-7800 is also available with concurrent alternate personalities that include DEC VT100,® IBM 3275/3276-2 (bisynch single station) and HP 2622, while still retaining IBM 3178/3278 compatibility.

And with the CIE-7850 plugged into the coax-A line, you have access to both on-line mainframe processing power and local IBM PC intelligence.

To learn more (and there are more advantages we haven't even touched on), just write or call our Distributed Systems Division Sales Representative: Alternate Channel Marketing, Inc., Suite 540, 3857 Birch Street, Newport Beach, CA 92660. Call toll-free 1-800-854-5959. In California, call 1-800-432-3687.

CIE SYSTEMS
A C.ITOH ELECTRONICS COMPANY

Alternate Channel Marketing, Inc. Exclusive Sales Representative
® DEC VT100 is a Registered Trademark of Digital Equipment Corp. © 1984 CIE Systems, Inc.

m ANAGEMENT
r EPORTING/RETRIEVAL
C APABILITY
FOR
THE IBM S/38
For more Information
Contact Charles White, at:
mrc michaels, ross & cole, ltd.
P.O. Box 4533
Oak Brook, IL 60521
(312) 986-9116

Communication courses offered for MIS professionals

Classes address presentation skills, cultural understanding, others areas

The number of courses, workshops and seminars designed to enable MIS professionals to hone their presentation skills is increasing. Following are some of the newer offerings and some of the courses that have been around for several years:

American Electronics Association (AEA)

The AEA has just launched a two-day workshop called "Presentation Skills," designed to eliminate the fear associated with public speaking.

It is also making available two other courses — "Productive Communication," designed to increase effectiveness in writing memos, reports and making presentations; and "Managing in a Multicultural Environment," which will be offered for the first time in September to give senior managers in data processing and related fields a better understanding of the different cultures from which their employees come, particularly those of the Far East, Southeast Asia and Central America.

Control Data Corp.

The Institute for Advanced Technology in Rockville, Md., is the CDC division that sponsors the company's courses for outside clients.

Among these courses are "Making Effective Oral Presentations," a step-by-step approach to public presentations, designed to build up confidence and provide techniques for organizing and presenting material; and a three-day seminar on negotiating skills, intended to provide an MIS professional with techniques for developing a negotiating style that fits his personality.

Interaction Associates

This San Francisco-based firm, founded by Michael Doyle and David Straus, co-authors of the best-seller *How to Make Meetings Work*, has a course titled "Manage Your Meetings," designed to help participants to hold "fewer, shorter, less stressful and more productive" meetings.

Kapur & Associates, Inc.

Based in Danville, Calif., this consulting company offers a course on "Effective Communication Skills," which was designed to reveal to participants their strengths and weaknesses in public speaking and to enable them to develop a better understanding of the power of good communication skills.

QED Information Sciences, Inc.

This Wellesley, Mass.-based company has one of the longest running courses for MIS professionals. "Effective Presentations," which has been given for 10 years, contains information on how to assess audience needs, how to avoid the use of jargon, the effective use of preparation time and how to deal with self-styled experts and armchair critics.

SPEECH

from page 37

Stokes, vice-president of the Wellesley, Mass.-based QED Information Sciences, Inc., the career paths for DP professionals will really take off when the DP department in an organization is confident of its ability to go outside the confines of MIS and make persuasive presentations.

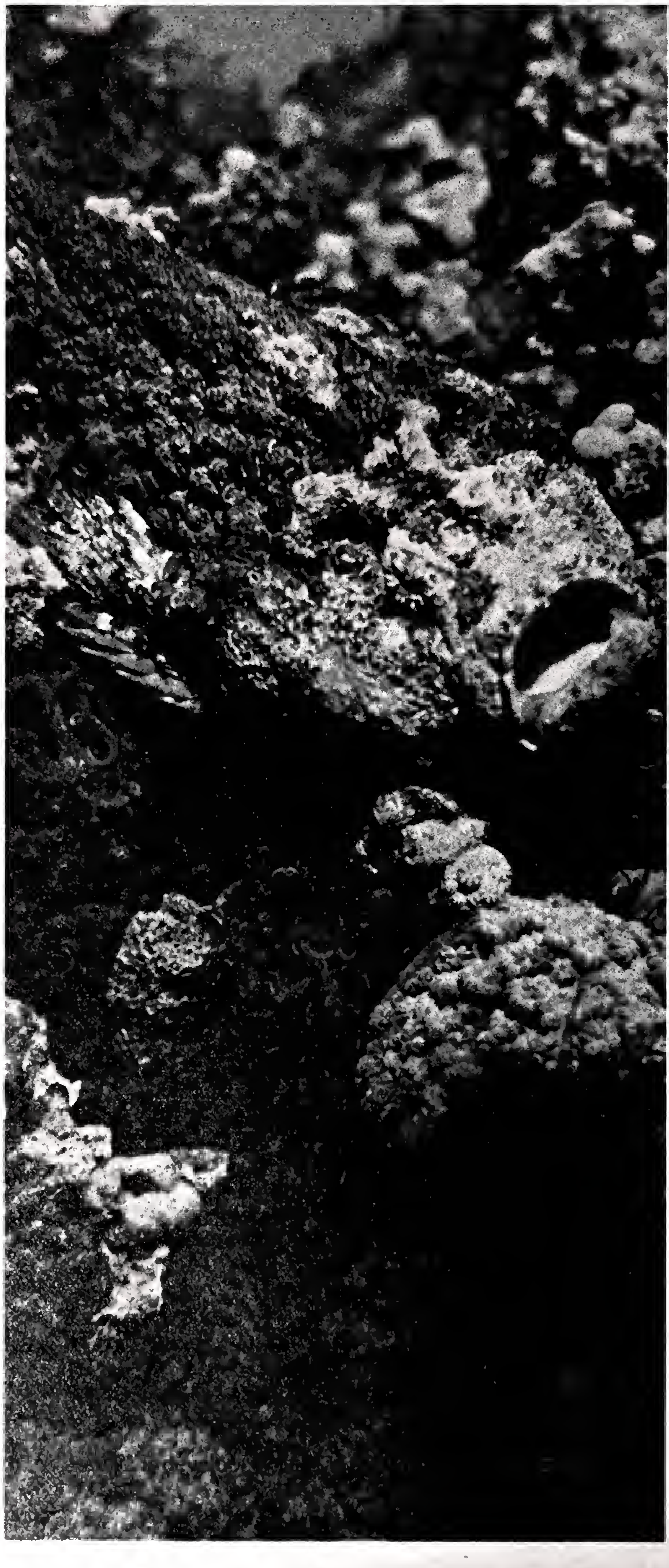
In a two-day course for DPers titled "Effective Presentations," Stokes has three objectives — enabling technologists to gain an understanding of their potential audiences, helping them more efficiently organize their material and ideas for use in presentations and giving them the ability to answer tough questions without becoming defensive.

GPU Service Corp., a Reading, Pa., utility company, is one of QED's clients; about 10% of its 300-person MIS staff has taken the course to date. "Most of us have not been trained in making effective presentations. To have practice in this art and give people the opportunity to play different roles is invaluable," commented Sharon Henry, the corporation's DP education coordinator.

Many training organizations involved in improving communication skills use similar methods. The use of video to gain feedback on individual presentations is a popular technique, while group exercises, individual writing projects and case studies are other often-used methods.

"The use of problem-solving exercises has a real value in that it allows participants to learn effective techniques and processes without getting too bogged down in the content of the problem," remarked Mary Franz, manager of the seminar department at Interaction Associates, a San Francisco-based management consultant.

Perhaps the most telling statement about the need for such training methods came from Laura Lockhart, a blind programmer analyst at Hewlett-Packard. Commenting on a course she took, she said, "Before I took the course, I always felt I was on the spot and people were evaluating me because of my blindness. This made me very nervous. [Now] I'm no longer afraid to get up in front of people and speak to them."



SECURITY, NATURE'S WAY.

Our Security System Does Something Nature Doesn't Do. It Protects The Data In MVS, VS1 And VM Environments.

Only one security software is the accepted standard for OS/VS environments: *ACF2, Access Control Facility.*

Over 1200 organizations, including many Fortune 500 companies, trust ACF2 for access control because it gives peace-of-mind against unauthorized disclosure, modification, or destruction of data.

With ACF2, all data is protected — automatically — by default. Authorization access is granted based on a need to know. This avoids confusion, assignment mistakes, and oversights.

Installation is fast. Implementation is painless. Critical data sets can be protected first, while less critical data can be secured in stages to avoid disruption of daily work routines.

All system resource accesses are monitored and controlled as they occur. A complete audit trail provides total accountability.

Surprisingly, all this control uses a minimum of administrative and machine overhead.

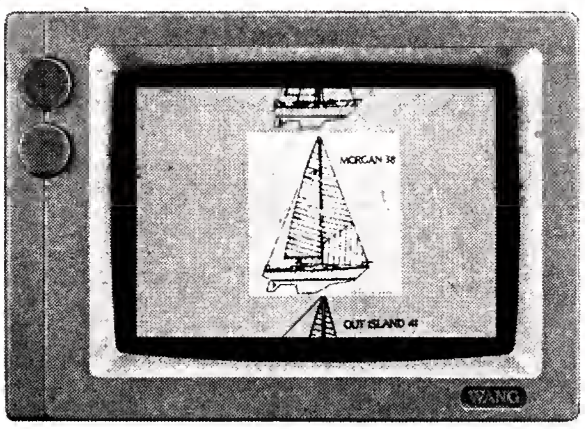
See how naturally ACF2 can blend into your environment. Call or write to arrange a personal presentation.

The Cambridge Systems Group

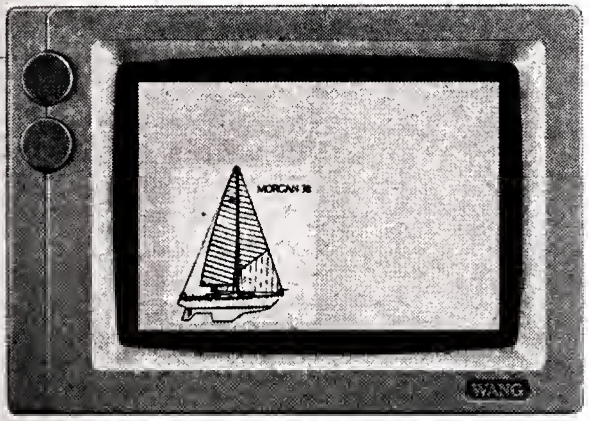
24275 Elise, Los Altos Hills, CA 94022, U.S.A.
(415) 941-4558 • Telex 357437

The first professional computer that looks at information the way you do.

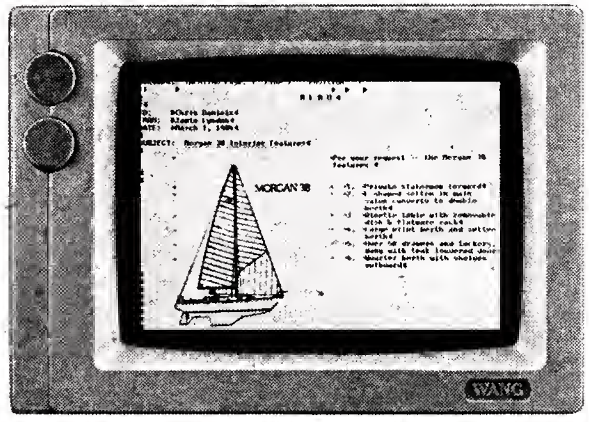
Place any document under the scanner, push a button and in seconds...



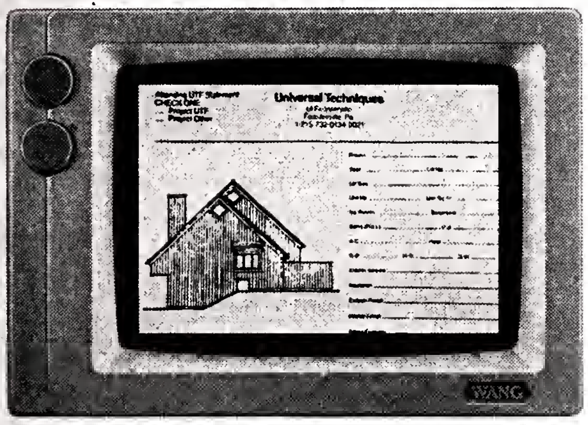
...it will appear on the monitor. You can store the whole document or isolate just part of it.



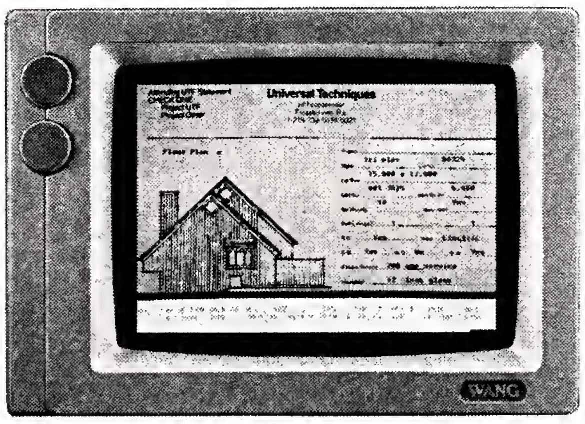
You can relocate any section...



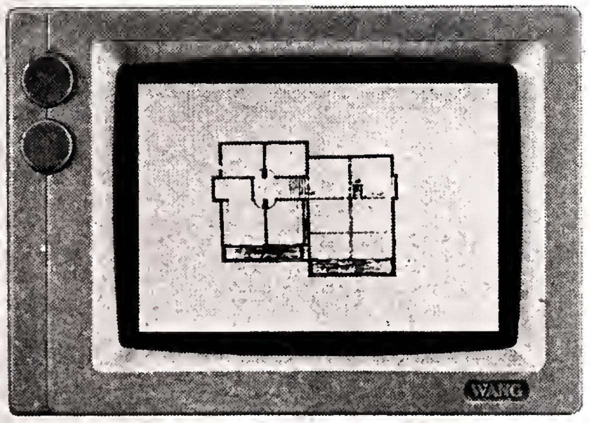
...and add text to create a new document, which can be printed or stored.



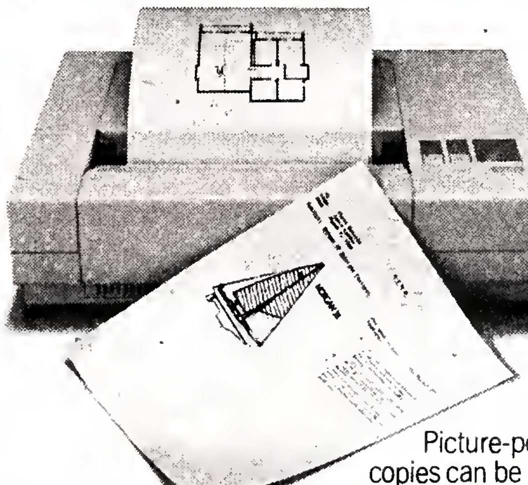
Filling out forms is a snap. Just place a form under the scanner...



...and fill in the blanks and update your database. Use the cursor (under "floor plan")...



...to bring up other image or data files associated with the original document.



Picture-perfect copies can be printed in seconds.

If you're in business, you get a lot of information exactly the way you're getting it right now.

From a piece of paper.

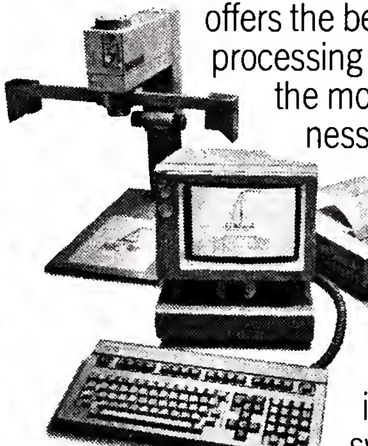
And a lot of time and money goes into managing that information.

But now Wang is introducing a computer that can help you manage that information even better:

The Wang PIC™ image processing system.

With the Wang PIC, business information can be scanned, displayed, edited, filed, printed, and sent anywhere in the world. Documents can be enlarged, reduced, landscaped, and contrasted. All from one desk-top computer.

The Wang PIC can communicate with other Wang computers and even most mainframes.



And you can start with a Wang Professional Computer. (A computer that already offers the best-selling word processing in the world and the most popular business software – including Visi On,™ Lotus 1-2-3,® and TK!Solver.™) And then grow to an image processing system with a simple upgrade.

If you would like a demonstration of The Wang PIC image processing system, call 1-800-225-9264. Or write to: Wang Laboratories, Inc., Business Executive Center, One Industrial Avenue, Lowell, MA 01851.

But do it today.

Because this is one new product you don't want to overlook.

WANG

The Office Automation Computer People.

CW36

©1984 Wang Laboratories, Inc.
PIC is a trademark of Wang Laboratories, Inc.
Visi On is a trademark of VisiCorp. Lotus 1-2-3 is a registered trademark of Lotus Development Corp. TK!Solver is a trademark of Software Arts, Inc.

TURNAROUND TIME

Larry Long

Q After numerous meetings and heated discussions, our company has decided to standardize on a single microcomputer. We anticipate authorization to double effectively the number of micros that we currently have, so our next order will be a big one.

Before we submit our order, I thought I'd check to make sure we are not getting in on the tail end of existing micro technology. Do you see any radical technological changes in microcomputers in the near future?

The highly competitive computer industry is sure to respond to need. I have no inside information, but am confident that substantially enhanced micros will be rolling off the line by the end of the year.

Looking into the crystal ball, I see a 32-bit, 2M-byte micro with software to support a multiuser environment, along with built-in hardware and software support for integrated micro/mainframe networking, all for under $3,500.

The price tag is what differentiates this projection from today's supermicros.

The very popular and familiar Unix operating system will probably become the standard for multiuser micros by mid-1985.

The days of floppy disks are numbered. Vendors either have or are developing software to network micros to mainframes in an integrated environment.

Eventually, most micro-type software and data bases will be downloaded to hard disks, or perhaps some nonvolatile memory. In the interim, I expect the small high-density microdisk to take the place of floppies for stand-alone micro operation.

There is a tremendous market demand for truly portable micros. Along with the multiuser micro, vendors will offer a reasonably priced, fully compatible, attache-sized micro.

We are becoming so dependent on computer capabilities that a portable computer is becoming more of a necessity than a luxury.

Q We have standardized on the IBM Personal Computer and are looking at user-oriented decision support system [DSS] software.

Currently, we have three terminals for every Personal Computer. The question has been raised as to whether we should provide host-based DSS software or select Personal Computer-based software.

We want to provide this capability to our users but we don't want to duplicate our efforts. In which direction are other companies moving?

Very few companies are even addressing this duplication problem. The simplicity, autonomy and capability of micros is a tremendous inducement for users to take advantage of the computer and information resources.

For whatever reasons, users are slightly less receptive to host-based DSS software.

However, host-based DSS software may afford users more sophistication in their requests for information, the potential for data integration and easier access to the corporate data bases.

Realistically, in the short term, you may be better served to accommodate some duplication.

Q Six months ago I became one of almost a hundred programmers who range in age from 21 to 40. My supervisor and most of the other team leaders are in their late 20s.

It seems that there are a great many people going into computer programming and that making computers a career is becoming increasingly difficult.

I'm an aggressive career-minded person and hope to move up the ladder. However, I am concerned that people who started in the computer boom five to 10 years before me will fill and hold the higher-level positions.

Will there be room at the top for people like myself who are just entering the computer field?

Most would agree that more people are entering the computer career fields, but the opportunities are expanding as well. You and other entry-level people must start at the bottom of the pyramid.

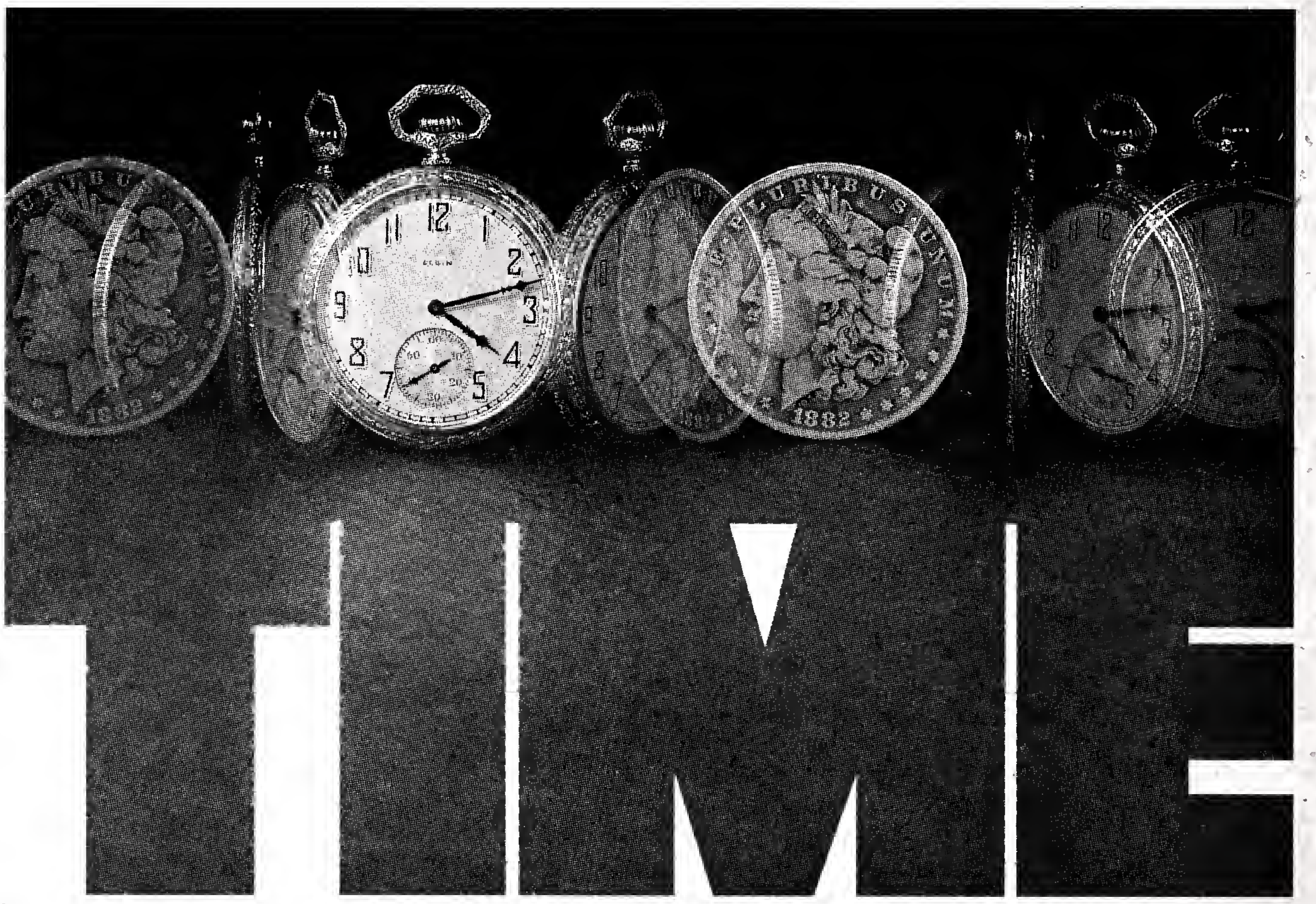
Sure, fewer people occupy each successive level in a pyramid. So what's new?

Keep in mind that computers and information services are not everyone's cup of tea. The attrition rate for those entering the computer field is high.

Even so, promotion to the next rung on the ladder is and will remain very competitive. A few are in the right place at the right time or have an "in" with management, but generally speaking, promotions in the computer industry are more a result of dedication and hard work than tenure.

I am confident that the ever-expanding opportunities for automation will continue to provide upward mobility for career-minded professionals.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*



Your Most Precious Resource

In any business, time is money! This is especially true when dealing with Data Communication Networks where system performance and **RESPONSE TIME is critical** to the user.

Degradation of system performance (responsiveness) is inevitable as customer work loads increase. Installing faster, more sophisticated hardware is a popular but temporary solution. It is only a matter of time until the problem reappears.

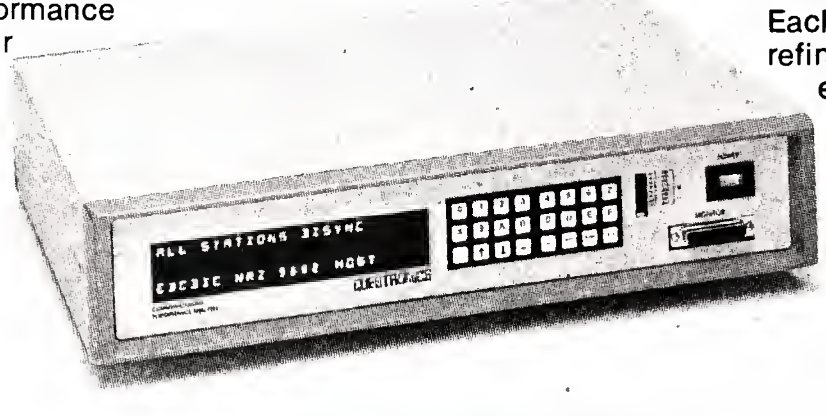
Questronics offers a solution through statistical performance analysis of your system. Over seventy-five categories of line utilization and response time information can be generated in eleven different reports (hard copy and/or data based).

Questronics model CPA/7 is setting the standard in the industry by providing vital performance statistics in the areas of:

- **User/System Response Time**
- **Line Utilization**
- **Character Transmission Counts**
- **Transmission Errors**
- **Host Resident Time**
- **Network Transmission Time**
- **Polling Counts**
- **Poll List Wrap Time**
- **Histograms**
- **Alarm Conditions**

Utilizing this information, DataCom managers can then make the crucial decisions necessary to fine tune and balance the network.

Each line may also be further refined to greater efficiency, enabling planning and projection for new growth.



Call Questronics and discuss your situation. We'll give you straight answers.

Answers through Analysis
QUESTRONICS INC.
3565 South West Temple, #5 • Salt Lake City, Utah 84115 • (801) 262-9923 • TWX 910-925-4000

Studies register concern for future OA environment

Office furniture makers, high-tech industry urged to cooperate

By John Desmond
CW Staff

WILLOW GROVE, Pa. — By the year 2000, the typical automated office environment will be noisier and less comfortable than it is today, unless computer manufacturing companies and office furniture makers combine to design proper desks, chairs, lighting and equipment.

That is the outlook put forward by the Administrative Management Society Foundation (AMS) in a study titled, "The Office Environment: Automation's Impact on Tomorrow's Workplace," which is said to combine results of 75 major studies by institutions, academics and government.

The mental and physical health of workers will also become of greater concern, with the possibility of exercise rooms complementing coffee klatch corners, suggested consultant Wilbert O. Galitz of St. Charles, Ill., an OA consultant who authored the second of a four-part research study.

VDTs on rise

VDTs will increase in number, from one for every 10 workers now, to two or three for 10 workers by 1990, the study predicts. Concern for VDT health-related issues, such as visual and posture problems and work stress, will thus pick up steam, according to the AMS.

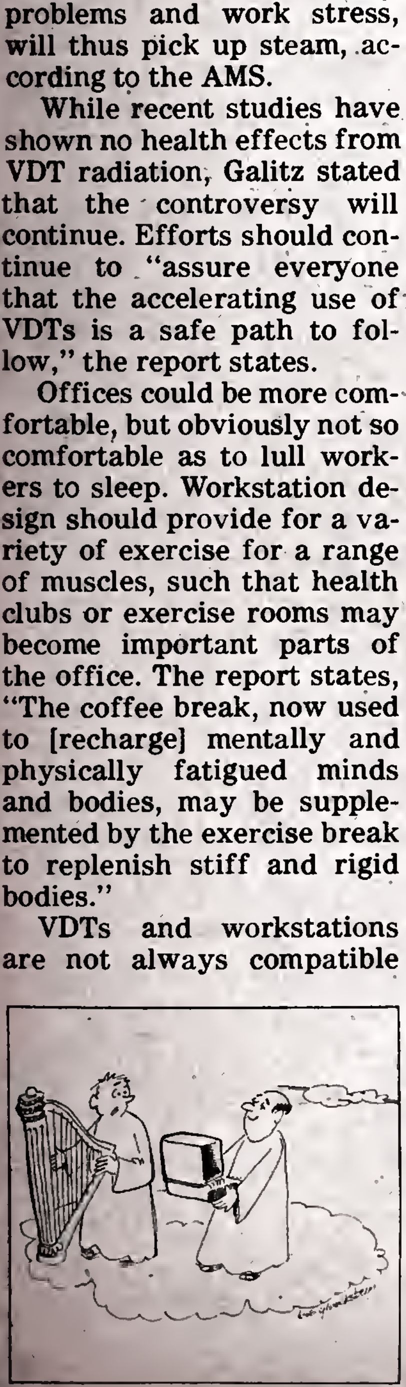
While recent studies have shown no health effects from VDT radiation, Galitz stated that the controversy will continue. Efforts should continue to "assure everyone that the accelerating use of VDTs is a safe path to follow," the report states.

Offices could be more comfortable, but obviously not so comfortable as to lull workers to sleep. Workstation design should provide for a variety of exercise for a range of muscles, such that health clubs or exercise rooms may become important parts of the office. The report states, "The coffee break, now used to [recharge] mentally and physically fatigued minds and bodies, may be supplemented by the exercise break to replenish stiff and rigid bodies."

VDTs and workstations are not always compatible with the arms, legs and eyes, according to the report, which goes on to warn that more communication between people and computers will increase office noise and require better consideration of acoustics. The report suggests that improved workstation design will require close coordination of furniture manufacturers, terminal manufacturers, facility managers and computer users.

No radical changes are foreseen in the structure of office buildings, offices and conference rooms. However, the report predicts that offices will be smaller as more work is performed electronically and at home.

The 1984 and 1983 AMS reports, "The Office Environment: Automation's Impact on Tomorrow's Workplace," and "The Office Revolution: Strategies for Managing Tomorrow's Workforce," respectively, are available separately for $14.95 softcover and $21.95 hardcover through the AMS Foundation, 2360 Maryland Road, Willow Grove, Pa. 19090.



© 1984 Comshare

Finally, a model-building kit with all the instructions right on the box.

Introducing System W's Model-by-Example.™

These days, you can't put a business model together unless you know a foreign language. And all the right commands.

Which is crazy.

Because while you're trying to figure out how to help the computer, the computer could actually be helping you.

So at Comshare we created Model-by-Example. Information that actually guides you through the model-building process.

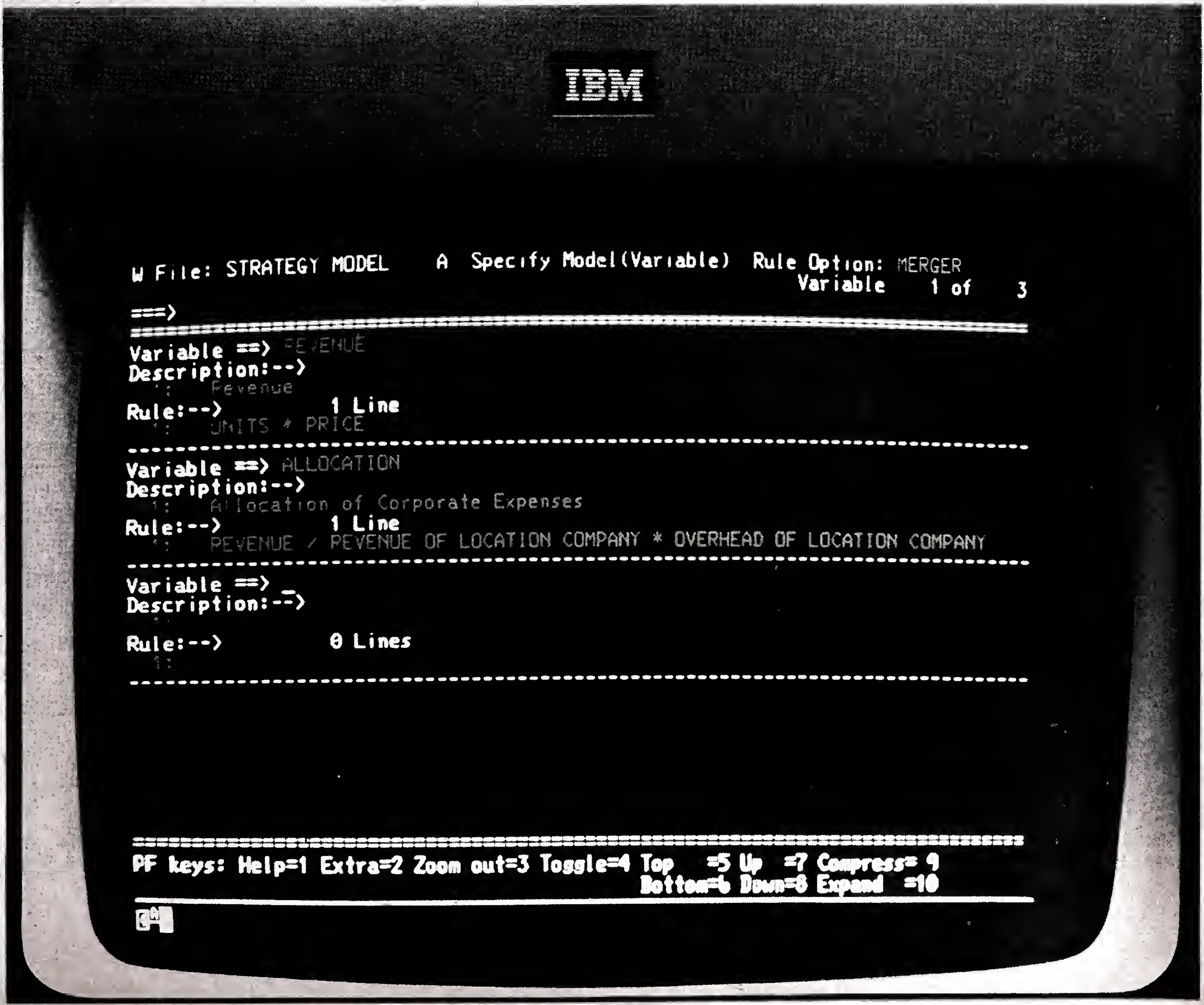
Not in a manual. But up on the screen.

You get a framework to follow. In a language you can follow. Which means you get piece-by-piece instructions that everyone can follow.

To find out more about Model-by-Example, call Chris Kelly at Comshare toll-free: 1-800-922-SYSW (in Michigan call: 313-994-4800). Or simply mail your business card to: Comshare, P.O. Box 1588, Ann Arbor, Michigan 48106. And get the one thing every model maker hopes for.

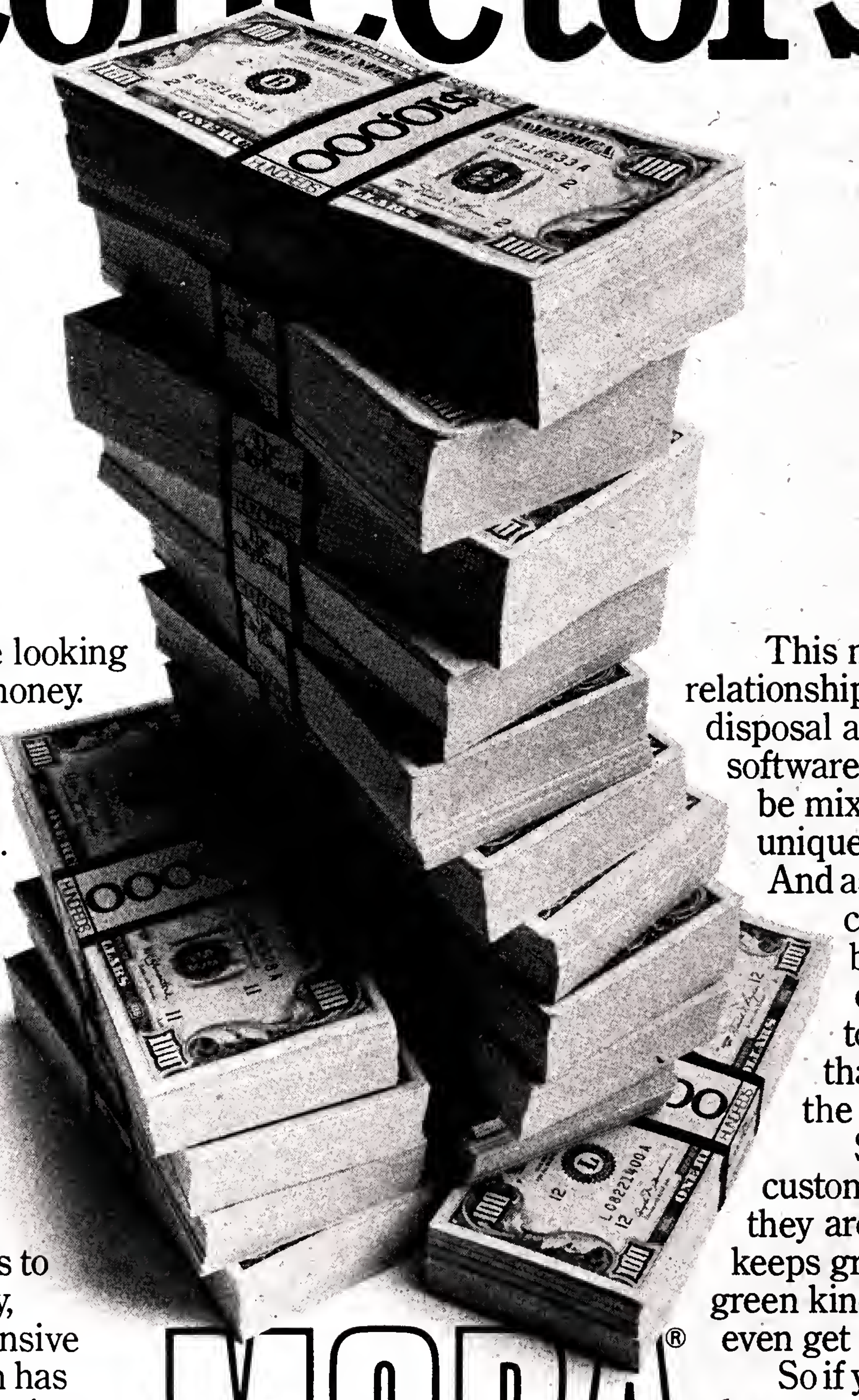
Easy assembly.

SYSTEM W DECISION SUPPORT SOFTWARE
COMSHARE



```
W File: STRATEGY MODEL     A  Specify Model(Variable)  Rule Option: MERGER
                                                        Variable    1 of    3
===>
================================================================================
Variable ==> REVENUE
Description:-->
   1:    Revenue
Rule:-->            1 Line
   1:    UNITS * PRICE
--------------------------------------------------------------------------------
Variable ==> ALLOCATION
Description:-->
   1:    Allocation of Corporate Expenses
Rule:-->            1 Line
   1:    REVENUE / REVENUE OF LOCATION COMPANY * OVERHEAD OF LOCATION COMPANY
--------------------------------------------------------------------------------
Variable ==> _
Description:-->

Rule:-->            0 Lines
   1:
--------------------------------------------------------------------------------




================================================================================
PF keys: Help=1 Extra=2 Zoom out=3 Toggle=4 Top    =5 Up   =7 Compress= 9
                                            Bottom=6 Down=8 Expand   =10
```

MCBA is looking for some professional bill collectors.



More specifically, we're looking for some dealers who like money. Lots of it. Because when you carry our powerful, field-proven software, that's exactly what you can expect.

Why? It's quite simple, really. The quality of MCBA's library of 17 modular manufacturing, distribution, and accounting packages is attested to by over 15,000 users worldwide. In fact, it's really the only serious software of its kind available for mini and micro environments. Thanks to its modularity and flexibility, not to mention its comprehensive documentation. All of which has helped us develop and maintain successful relationships with dealers like you for over 10 years now.

This means you can establish a relationship with us and have at your disposal a comprehensive library of software packages. All of which can be mixed or matched to suit the unique needs of your customers. And as your customers grow, they'll come back to you for more business. Because you can expand their systems with totally integrated packages that work with each other like the movement in a Swiss watch.

So no matter what size your customers are now, or what size they are tomorrow, your business keeps growing. And the bills (the green kind) keep pouring in. It might even get embarrassing.

So if you're a dealer who's in it for the money, call MCBA now at (818) 957-2900. You may not end up being famous. But you could end up rich.

MCBA®

Software that grows on you. And with you.™

2441 Honolulu Avenue, Montrose, California 91020 For HP, Wang, DEC, and TI minis; and UNIX, RM/COS, and PC-DOS-based micros. MCBA® is a registered trademark of MCBA, Inc.

OFF THE PRESS
George Harrar

BOOK REVIEWS

COMPUTERS IN CRISIS
By Jerome T. Murray and Marilyn J. Murray

The subtitle — "How to Avert the Coming Worldwide Computer Systems Collapse" — teases the reader with the threat of unnamed calamity. As in all good doom-predicting books, there is, of course, the promise of a solution.

The crisis will be triggered on Jan. 1 of the year 2000 by a simple situation: Programs rely on six-digit date fields. Which date is later, 12/31/99 or 01/01/00? Programs would say the first; programmers and everyone else naturally answer the second.

Sixteen years seems sufficient time to solve this problem. But the Murrays foresee trouble: "The true potential for disaster lies in our tendency to procrastinate . . . our readiness to 'patch' or treat symptoms until it is often too late to [eradicate] successfully the disease."

The disease's course is poetically described: "We may well expect widespread suspension of computer processing in the year 2000 and beyond, with many terminal screens as dark as a villain's heart."

The six-digit dilemma affects almost all industries by disrupting the aging of accounts receivable and payable, pensions, benefits eligibility and so on. It is a user problem, but one that could use vendor help.

The authors write "An Open Letter to Our Leading Vendor" in which they ask, among other changes, "Please replace the current system-generation option for the six-digit IPL date: mm/dd/yy or dd/mm/yy or yy/mm/dd, with the eight-digit option, mmddyyyy or ddmmyyyy or yyyymmdd."

Even if vendors come to the aid of their users, the conversion still will be a mammoth task of altering data, invading source logic and modifying input protocols. An example is cited of a Fortune 500 company with a library of 50,000 Cobol programs, averaging 750 lines of code each for a total of 37,500,000 total lines. Figuring a productivity rate of 15 debugged lines per day, the authors calculate more than 21 years of work by 500 programmers to rewrite it all.

The book overdramatizes the date-digit problem, in part to draw attention to it. Others have ventured the same thesis more quietly and stirred up little or no interest.

Much of the book can be overlooked. The preface lays out the problem well; Chapter 1 provides interesting background on time and its calculation, and Chapter 11 prescribes a conversion solution for users. Read those sections if nothing else.

Hardcover, 360 pages, $32.95, ISBN 089433-223-6, Petrocelli Books, Inc., 1101 State Road, Princeton, N.J. 08540.

GETTING STARTED WITH THE IBM PC AND XT
Edited by David Arnold

In partnership with *PC World* magazine, Simon & Schuster, Inc. launches the PC World Library with this introduction to IBM's Personal Computer and Personal Computer XT models.

This attractively designed first volume is an unabashedly friendly and positive look at what novice users can do with their new machines. This is a hand-holding book that puts pages of definitions where the reader needs them — before the technical sections rather than tucked away in an appendix.

Future volumes in the *PC World*-Simon & Schuster series promise to cover desktop applications, communications and hardware for the Personal Computer and XT. Additional books will feature PCjr — how to get started and have fun with it.

Paperback, 183 pages, $14.95, ISBN 0-671-49277-2, Computer Book Division, Simon & Schuster, 1230 Ave. of the Americas, New York, N.Y. 10020.

AN INFORMATION SYSTEMS MANIFESTO
By James Martin

There is little reason to paraphrase James Martin. He is that rare writer in the computer field, one who expresses himself clearly and forcefully. He writes:

"What is needed instead is freedom for user areas to employ their own initiative in creating the systems they need, but they still must obey certain laws. They make *systems conform to a set of rules that permit them to interchange data, now and in the future.*

"Perhaps the most notorious class of systems-that-don't-work is management information systems.

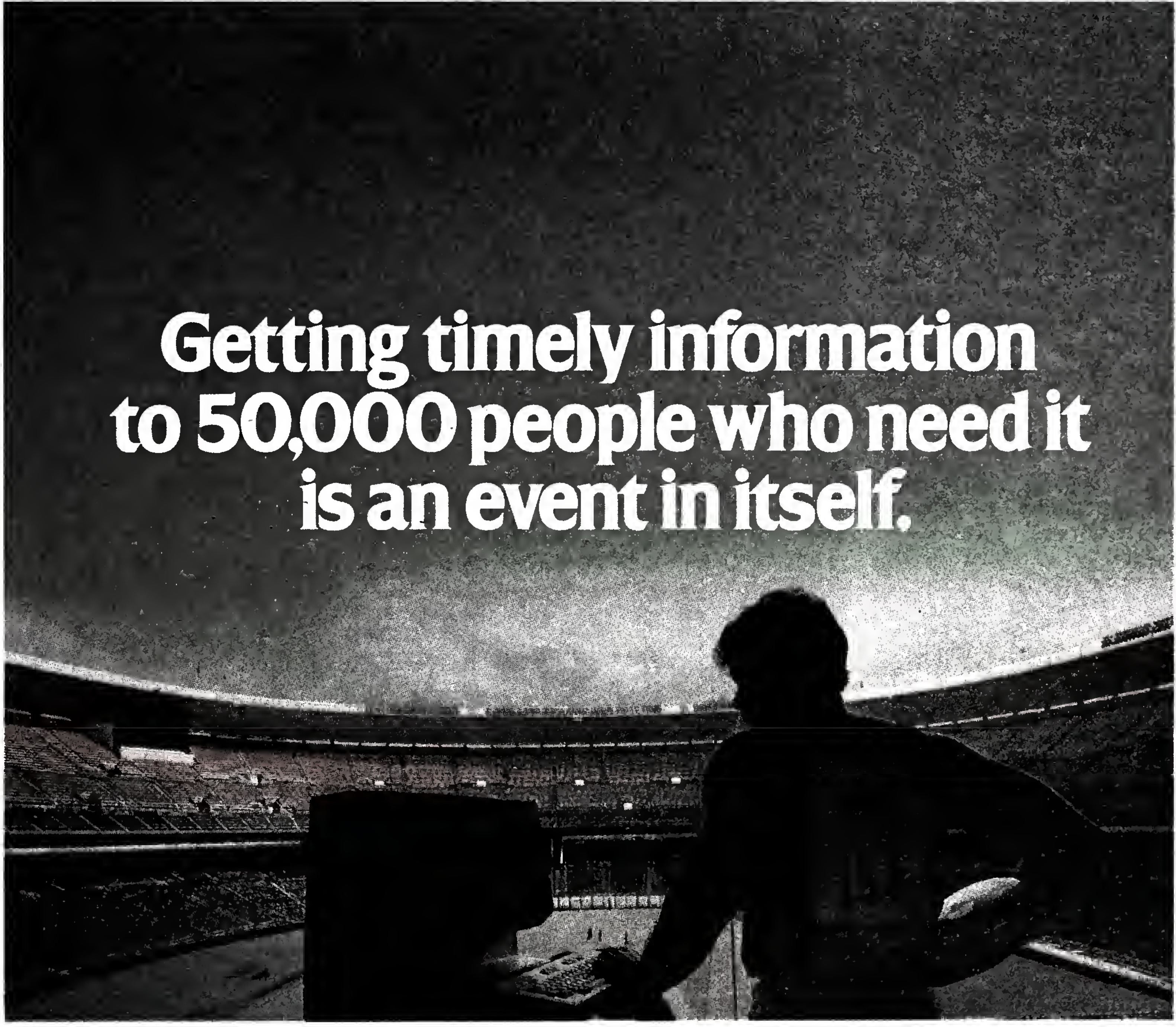
"It is the job of management to build a computerized corporation, and the foundation stone of that is the data models that are used.

"Prototyping is by far the most effective for giving the user a clear, realistic representation of the system that is to be built.

These quotes reflect this book's

See **BOOKS** page 44

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, *P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.*


Getting timely information to 50,000 people who need it is an event in itself.

Behind the action, pageantry and spectacle of the 1984 Olympic Games is one of the most extensive data communications systems ever built.

The Electronic Messaging System—12 computers, 1,700 terminals, 300 printers—was created for the 1984 Olympics by AT&T. And tied together with Infotron networking equipment.

The EMS is designed to replace the old system of hand-carried reports in the world's first multi-site Olympics. It does everything from displaying event results, to supplying athlete biographies for reporters, to providing schedules, qualifying information and personal messages to the participants themselves.

The system's true complexity lies in the numbers of people it serves: the 50,000 officials and reporters, coaches and athletes of the Olympic family. But the demands placed on it are very much like the demands all Infotron customers place on their networks.

Performance. Flexibility. Reliability.

Advanced Network Integration from Infotron—a sound basis for networks of any size or configuration. Simple.

Or breathtakingly complex.

We're proud of the part we're playing.

Infotron.
First in performance and reliability.

Infotron Systems Corporation,
9 North Olney Avenue, Cherry Hill, NJ 08003.
Or call toll-free: 1-800-345-4636.

Send for our informative book, *Making It Through the Maze of Data Communications.*

Name________________
Title________________
Company________________
Address________________
City________ State____ Zip____
Telephone________________
CW6/11

INFOTRON SYSTEMS

BOOKS

from page 43

dominant themes: data processing departments in crisis; the end user as the driving force in systems development (a favorite subject); and systems requiring mathematically provable design, made possible now by a new technique called higher order software.

DP's crisis reflects the larger plight of corporations that must use information systems to stay competitive within their particular industry. They find themselves shackled to the past by huge investments in the old ways of doing things. To solve new challenges placed before it by management, the DP department must wield information as a strategic weapon.

Martin says it is the manifesto of senior management to ensure that DP can respond quickly to the organization's needs by employing fourth-generation languages, information centers, flexible data bases and information engineering.

One apparent need of the organization is for end users to create their own applications. Martin advises the "mature" DP executive to go with the trend. In fact, it should be his job to provide end users with the necessary software tools, networks and analysts to get their work done.

About the third major point — mathematically provable design — Martin says, "This methodology is so powerful that it needs to be regarded as a major new technology for creating systems which in a sense obsoletes earlier structured techniques."

Hardcover, 300 pages, $37.95, ISBN 0-13-464769-6, Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

SILICON VALLEY FEVER

By Everett M. Rogers and Judith K. Larsen

Take a walk through California's Silicon Valley.

Just off Highway 101 near Intel Corp.'s headquarters, there's the Peppermill, the breakfast meeting place for customers and competitors alike to strike deals and trade information.

After hours, it's Walker's Wagon Wheel Bar and Restaurant in Mountain View or the Cow Girl Bar in Sunnyvale for the valley professional who can't get enough of trade talk.

At 3000 Sand Hill Road in Menlo Park, alongside Stanford University, 15 venture capitalist firms try to uncover the next Apple Computer, Inc., Rolm Corp. or Tandem Computers, Inc. opportunity.

As Sand Hill Road is to venture capitalists, the Palo Alto Square buildings are to lawyers who keep legal the affairs of start-ups through mature companies.

There is a tendency for any book that relies on informal conversations rather than rigorous research to generalize on the basis of a small sample. The authors often take the extreme example too seriously, presenting it with the attitude of "there, that's how it is."

For instance, we are told the story of Ray Brant, vice-president for human relations at National Semiconductor Corp., who required 24-hour-a-day intravenous medication to treat a rare blood disease. No slouch, Brant carried his intravenous bottle and pump with him to meetings. He even arranged his car so the medication was pumped into him as he drove.

Brant said about his extraordinary desire to stay working at his job: "If I backed off work for six weeks, I'd be too far off-stream when I came back."

The authors generalize: "Some of the work intensity is self-induced; perhaps the ambitious people working in Silicon Valley prefer pressure."

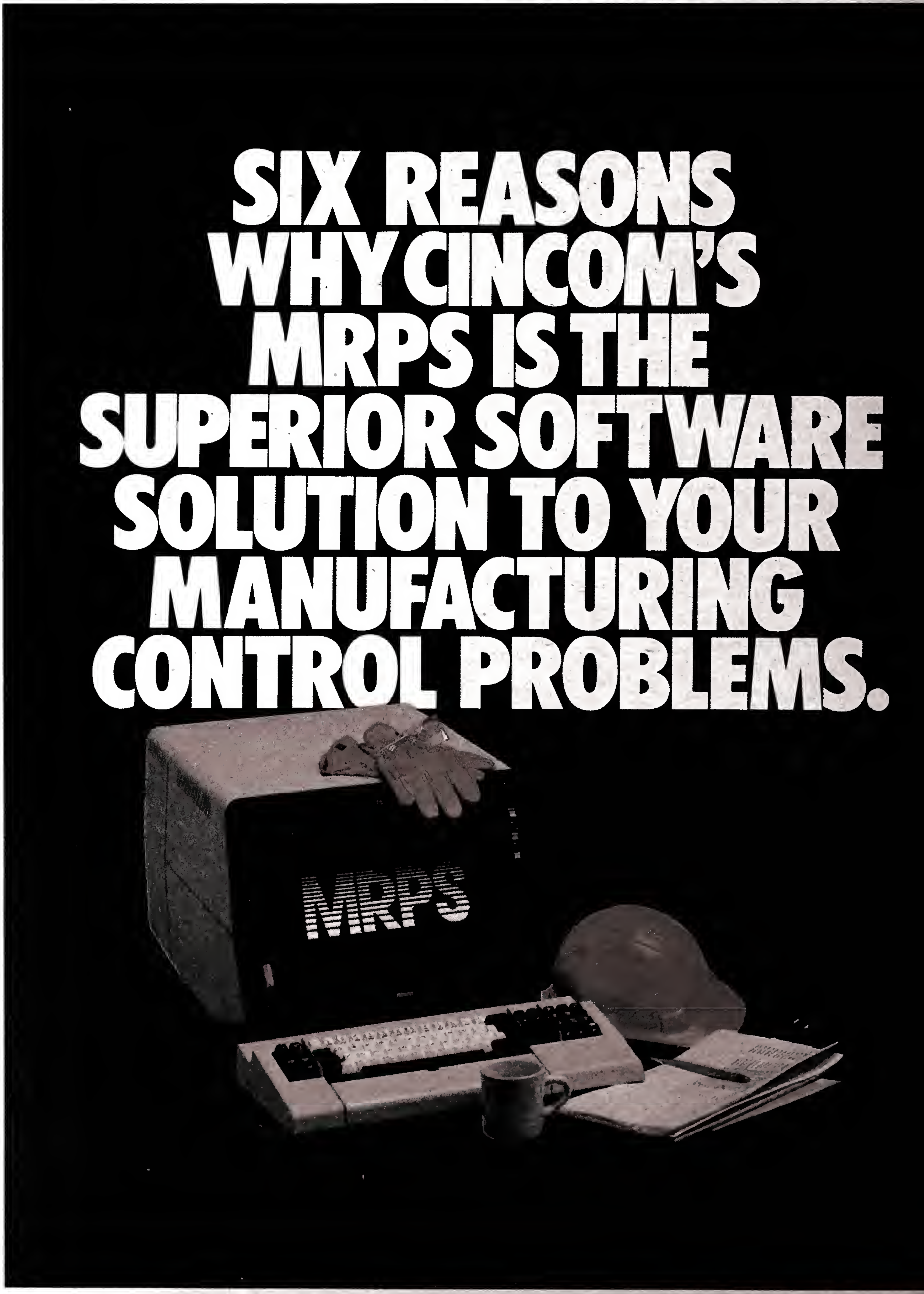
For anyone on the outside who cares about Silicon Valley, this book gives a lively inside look. All the doers are here, from Fred Terman to Steve Wozniak. After a while, though, all those pressure-loving ambitious people who started in a garage seem just a bit ordinary.

Hardcover, 302 pages, $19.95, ISBN 0-465-07821-4, Basic Books, Inc., 10 E. 53rd St., New York, N.Y. 10022.

ARTIFICIAL INTELLIGENCE APPLICATIONS FOR BUSINESS

Edited by Walter Reitman

Artificial intelligence technology should become a


SIX REASONS WHY CINCOM'S MRPS IS THE SUPERIOR SOFTWARE SOLUTION TO YOUR MANUFACTURING CONTROL PROBLEMS.
MRPS

$2.8 billion business by 1990 and may obviate large DP shops in many corporations. So says a research study by DM Data Co. of Scottsdale, Ariz. The predictions should cause many in data processing to look closely at this collection of essays which investigates the current and future penetration of AI in business.

To move from laboratory curiosity to commercial tool requires funding, of course, and the book's editor identifies three sources: large corporations, either through MIS or separate AI groups; AI software houses; and the government, particularly through defense agencies.

The book covers the standard subjects, such as expert systems, natural language interfaces, robotics and so on. But the publisher's advertising promises more — some thought on how AI development will affect the development of management information systems, including staffing and internal corporate financing. These issues are neglected in this book, as they are so often in the rush to define what AI is and can do. Yet these matters are exactly what may concern DP managers most — particularly if, as the DM Data study forecasts, many of them could see their shops disappear.

Hardcover, 352 pages, $37.50, ISBN 089391-220-4, Ablex Publishing Co., 355 Chestnut St., Norwood, N.J. 07648.

PROGRAMMER PRODUCTIVITY

By Girish Parikh

Efficient programming technique is the focus of this new book by the Chicago-based consultant and writer.

The chapters conveniently cover one topic each, such as top-down development, measuring productivity or the Warnier/Orr diagram. Sections within chapters are well-marked with subtitles to reinforce for the reader the major points being made.

The tips and case studies are drawn from Parikh's years of programming experience since he took his first Fortran course at the Milwaukee School of Engineering in the late 1960s.

The author is a tireless proponent of programmer productivity.

Hardcover, 235 pages, $49.95, ISBN 0-8359-5650-4, Reston Publishing Co., 11480 Sunset Hills Road, Reston, Va., 22090.

BOOKS OF NOTE

DATABASE MANAGEMENT SYSTEMS, a practical approach to data base methodologies from the user's perspective, edited by R. A. Frost: hardcover, 265 pages, $36.95, ISBN 0-07-022564-8, McGraw-Hill Book Co., 1221 Ave. of the Americas, New York, N.Y. 10020.

TELECOMMUNICATIONS FOR THE EXECUTIVE, an overview of voice, data and message technology for managers, by Ronald R. Thomas: hardcover, 129 pages, $19.95, ISBN 089433-233-3, Petrocelli Books, Inc., 1101 State Road, Princeton, N.J. 08540.

WORKRIGHTS, the legal rights claimed by employees in information jobs, by the publisher of *Privacy Journal*, Robert Ellis Smith: paperback, 267 pages, $8.95, ISBN 0-525-48047-1, available from *Privacy Journal*, P.O. Box 15300, Washington, D.C. 20003.

THE BIG BYTE, a novel of computers, saboteurs and the banking system, by Peter J. Ognibene: paperback, 311 pages, $2.95, ISBN 345-31418-2, Ballantine Books, 201 East 50th St., New York, N.Y. 10022.

REINVENTING MAN: THE ROBOT BECOMES REALITY, explores the possibility of reinventing human intelligence in machines, by Igor Aleksander and Piers Burnett: hardcover, 301 pages, $17.95, ISBN 0-03-063857-7, Holt, Rinehart and Winston, 521 Fifth Ave., New York, N.Y. 10175.

ENGINES OF THE MIND: A HISTORY OF THE COMPUTER, about "interesting" machines and "fascinating" people who changed the world, by Joel N. Shurkin: hardcover, 352 pages, $17.50, ISBN 393-01804-0, W.W. Norton & Co., 500 Fifth Ave., New York, N.Y. 10110.

THE COMPUTER COMES OF AGE, the first of a series exploring the history of computers and data processing, by Rene Moreau: hardcover, 227 pages, $19.95, ISBN 0-262-13194-3, The MIT Press, 28 Carleton St., Cambridge, Mass. 02142.

MRPS

Whether you're a corporate DP manager, a manufacturing executive or a shop-floor supervisor. Cincom's MRPS is the superior solution to your manufacturing control and planning problems. There are many reasons why. Here are six:

1. High Performance
MRPS is a well-designed, well-written system with proven on-line performance. MRPS fits easily into virtually any DP strategy and it provides state-of-the-art manufacturing control without disrupting established manufacturing procedures.

2. DBMS Integration
Unlike other manufacturing software systems which are based on the enhancement of older technology, MRPS is based on completely new technology designed to meet today's modern manufacturing needs. Powerful on-line DBMS integration insures data integrity and increases information availability. Simply stated, MRPS keeps the information accurate. And accurate information leads to better business decisions which ultimately lead to greater manufacturing efficiency.

3. Unparalleled Portability
MRPS offers an unparalleled degree of hardware portability for IBM mainframe and DEC™ VAX™ users. For situations where the high performance of the VAX is needed, VAX modules are available. For tasks best handled by the IBM mainframe, IBM modules can be used. This compatibility provides the freedom to establish one consistent approach to manufacturing control throughout the organization.

4. Modular Growth Path
MRPS is a modular system that provides comprehensive manufacturing control. Virtually every manufacturing need is addressed in one of four planning modules which include: Manufacturing Materials Planning. Master Production Scheduling. Production Planning & Control. And Vendor Analysis & Purchasing. Due to the extreme flexibility of its modular design, MRPS can be tailored to meet specific needs. You can begin with the module, or modules, that address immediate needs. Then, as you grow, MRPS can grow with you.

5. Proven In Use
In more than 100 installations around the world, MRPS is providing dramatic improvements in both the productivity of the individual user and the company as a whole. The on-line high performance of MRPS has made believers out of many manufacturing managers who have been disappointed with the performance of other manufacturing systems.

6. Cincom Systems Support & Service
Invest in MRPS and you will establish a relationship with a company dedicated to customer satisfaction. As a Cincom customer you have at your disposal the education, service and support capabilities of one of the world's largest software vendors. With over 50 service and support locations and over 2,000 manufacturing customers, Cincom Systems has helped more manufacturing organizations solve their systems software problems than any independent software vendor.

For more reasons why MRPS can increase the productivity of your manufacturing environment, ask for our FREE full-color MRPS brochure. We'll also be happy to send you information on any of the Cincom family of major new software technologies. Simply call or write,
Cincom Marketing
Services Department, 2300 Montana
Avenue, Cincinnati,
Ohio 45211.

800-543-3010
(In Ohio: 513-661-6000)
(In Canada: 416-279-4220)

Cincom Systems
Excellence in Software Technology.

Micros alter mainframe users' desires, forum told

By Paul Korzeniowski
CW Staff

FORT LAUDERDALE, Fla. — The microcomputer influx has changed large system users' desires and placed unrealistic demands on data processing departments, a speaker at a recent forum here said.

"The mainframe market today is beginning to appreciate interactive solutions," Jeffrey Walker, chairman of Walker Interactive Products, said at "Personal Computers and Workstation Trends and Applications for End-User Productivity," a forum sponsored by Enterprise Information Systems, Inc. of Greenwich, Conn.

Walker noted that familiarity with the interactive capabilities of personal computers is fueling a desire for real-time systems. Users are no longer satisfied with batch systems: "Batch systems are dinosaur systems and soon to be extinct."

On-line applications do not placate these desires. "On-line will be a short-lived market influence because buyers really want interactive solutions, but do not know the difference between on-line and interactive," Walker said. He believes that users want to update materials instantly and are not satisfied waiting until the next day to update data.

Once users realize this difference between interactive and on-line systems, MIS managers are forced to develop interactive systems, he said.

Traditional system development has been riddled with problems, Walker said. Often, costs were more than planned, and systems were seldom implemented on schedule and were inflexible and difficult to maintain.

Designing these systems requires a great deal of technical expertise, a quality that is difficult to find. "As competition for quality workers intensifies and salaries are being driven higher and higher, the life of the data processing manager is further complicated," Walker said.

Once the system is designed, headaches do not cease. "It seems that if the data processing department can make users happy, that happiness has a short duration," Walker said. Reasons for this include user management changes, regulatory changes and fundamental business changes. Maintenance becomes another MIS manager headache.

To alleviate these problems, Walker recommended a new approach to system development: strategic software. This approach gives the user the tools to change system design. "Returning total control of an application to the user represents a philosophical shift," Walker said. It also helps to free the data processing department from maintenance work.

Keeping technical personnel happy for long periods of time is also difficult, Walker noted. The rush to the latest and best system often leaves a company with incompatible pieces of the system.

When designing applications, MIS managers have to be concerned about how an application will work if the department changes its data base, upgrades its central processing unit or adds a new operating system.

Strategic software helps alleviate these technical problems by including a layer of software that tailors an application to a number of different operating environments. "MIS managers should not fall into the trap of having so many technologies upon which to depend that you have little latitude making a decision," he said.

Introducing.
Software for the operations manager.

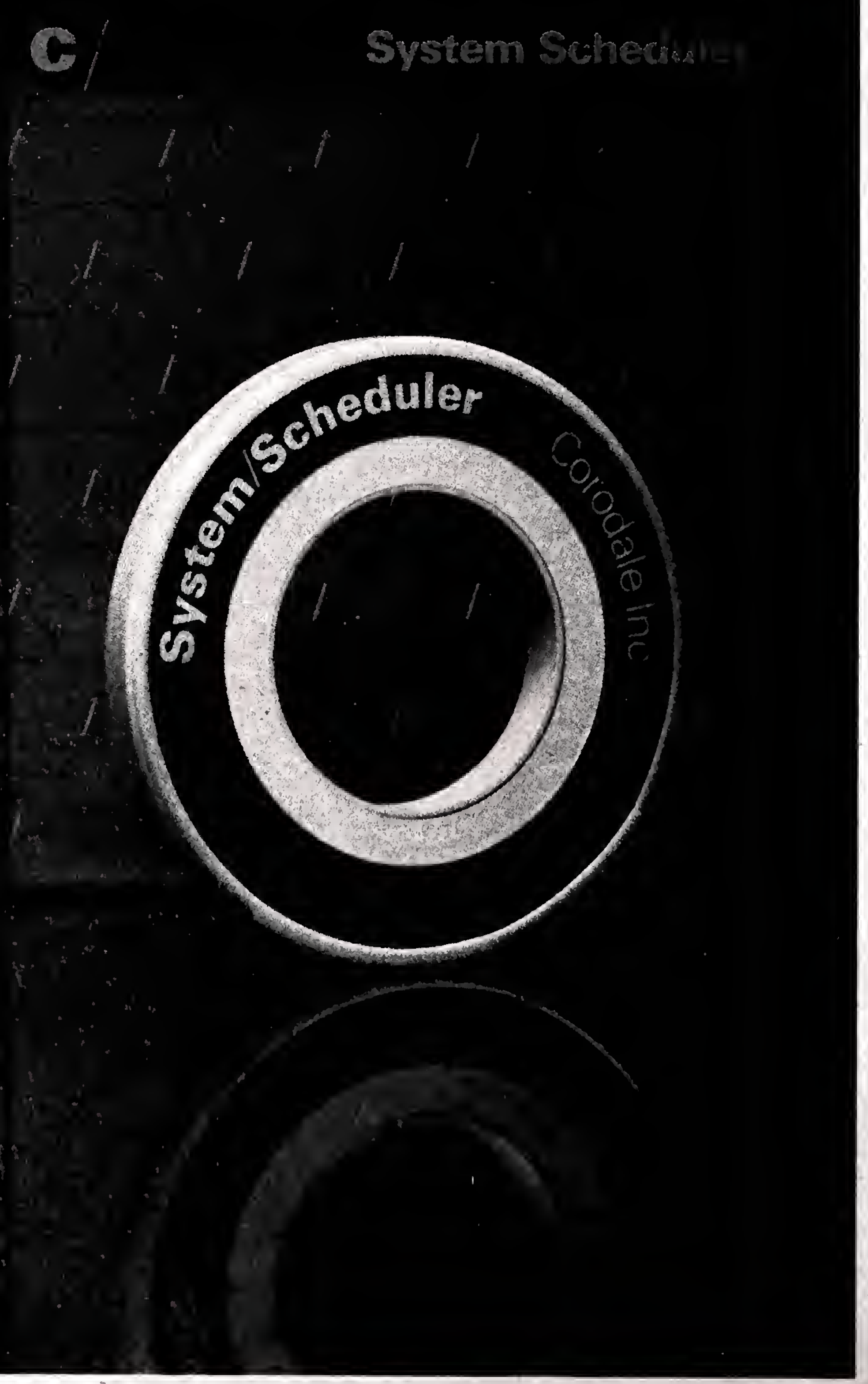
The automated
DOS/VSE
data center.

It's Corodale's new System/Scheduler. A better way to log, schedule and monitor processing activity.

System/Scheduler organizes the data center. Eliminates no runs, misruns and reruns. And adds efficiency, accuracy and integrity.

Moreover, we can prove it with a no-obligation trial. Your facilities. Your work. Your savings.

Simply call us at
617 · 426 · 8780. Or write :
Corodale Incorporated
211 Congress Street
Boston Massachusetts
02110.



EFDPMA sets July seminars

TORRANCE, Calif. — A series of seminars designed for software engineers, project managers and analysts covering the topic of software requirements analysis are scheduled to be conducted in three U.S. cities in July.

The Education Foundation of the Data Processing Management Association (EFDPMA) is sponsoring the two-day seminars. The dates and places are July 9-10 in Orlando, Fla.; July 12-13 in Washington, D.C.; and July 16-17 in Boston.

Sessions will address such topics as system software requirements analysis, managing requirements analysis phase, implementing requirements analysis techniques, evaluating and selecting requirements analysis tools, techinques and methods and ensuring correct, complete and testable specifications, according to the sponsor.

Richard H. Thayer, an associate professor of computer science at California State University at Sacramento, will serve as guest expert during the seminars.

The registration fee is $495 per person. The fee for DPMA individual members is $465.

The cost for groups of three or more persons or for university and government employees is $425 each, according to the sponsor.

More information is available from EFDPMA Seminars, through P.O. Box 3608, Department SRA, Torrance, Calif. 90510.

Micro users will become more productive, speaker says

Software architect delineates changes, methods that will ensure productivity boost

By Paul Korzeniowski
CW Staff

FORT LAUDERDALE, Fla. — A quantum productivity leap awaits the next generation of microcomputer users.

So said Jon J. Cooper, principal software architect at Fortune Systems Corp., who outlined the hardware and software changes needed to ensure that leap at the recent Personal Computer and Workstation Trends and Applications for End User Productivity forum here. The forum was sponsored by Enterprise Information Systems, Inc. of Greenwich, Conn.

Cooper measured productivity by dividing the amount of work a person completes by the length of time the task requires. Consequentially, productivity gains can be obtained by increasing the quantity of work completed or decreasing the time needed to produce it.

Decreasing time

The software architect listed four ways to decrease the time needed to complete a task: increase the bandwidth between the computer and the data; speed data retrieval; improve presentation of output; and increase the speed which users can input data.

Three architectural advances widen the bandwidth between a user and a computer: wide-area networks, local-area networks and bus-area networks.

"Local-area networks require transmission speeds faster than current asynchronous methods," Cooper stated.

Increasing data retrieval

To increase data retrieval, Cooper said, better hardware and software designs are required. Faster microcomputer disk drives, command chaining and advanced controllers would circumvent current hardware limitations.

Software improvements include writing programs that store directories, indexes and other methods to identify data relationships in central storage, rather than writing them on a floppy disk.

"Retrieving data from a disk requires two disk accesses, one to the disk and a second from the disk," Cooper said. "This process significantly slows the system."

Another improvement

Another software improvement Cooper advocated was distributed data storage, which keeps a number of files, rather than one central file on a network. "This type of system requires a sophisticated network manager," Cooper noted.

To improve output presentation, future microcomputers should incorporate graphics terminal techniques. Apple Computer, Inc.'s Macintosh is a significant step in this direction, Cooper said.

To increase the speed at which users can input data, new types of data entry methods will be developed.

Mouses, touch screens and voice commands are three techniques that increase productivity, Cooper said, but other advances are needed.

"I would like to see a product that allows the cursor to follow the movement of my retina," he said. "It would be nice if the computer beeped as a warning if I looked away from my work."

Increasing data production

Cooper mentioned four methods of increasing the amount of data that a user produces: higher resolution displays; more than one simultaneous input mechanism; several simultaneous output mechanisms; and multiple-processor microcomputers.

Higher resolution displays allow a user to view more data. "With a 132-column display, the user works with 40% more data than [with] the standard 80-column display," Cooper said. These displays convey an image instantly and transmit graphics applications to users who think graphically.

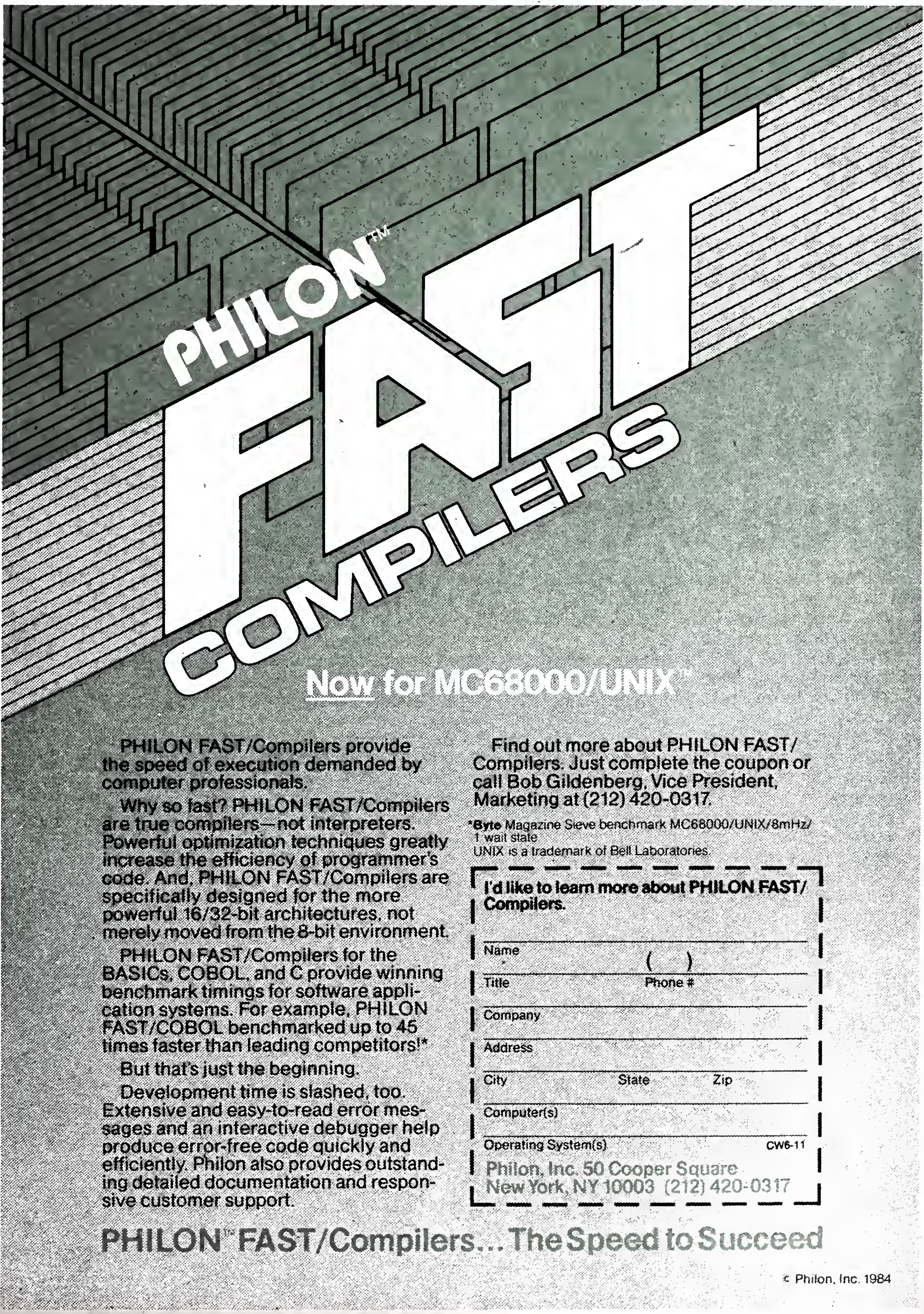
While sitting at a terminal, a user should be able to work like an organ player, who simultaneously uses a number of sense mechanisms, according to Cooper. The user's eyes can read text while his hands, feet and voice can input data.

Voice input promising

"Voice input has shown great promise for increasing the amount of data a user can input," Cooper noted.

A significant problem with most current windowing packages, he said, is that only one window at a time is processing data. Microsoft, Inc.'s MS-DOS is a dinosaur, Cooper said. "A multitasking operating system will be required for the next generation of users."

To use a multitasking operating system efficiently, multiple microprocessors will be needed. "Because you are placing such as strain on the system, coprocessor boards will be needed for future microcomputers," Cooper predicted.



PHILON FAST/Compilers provide the speed of execution demanded by computer professionals.

Why so fast? PHILON FAST/Compilers are true compilers—not interpreters. Powerful optimization techniques greatly increase the efficiency of programmer's code. And, PHILON FAST/Compilers are specifically designed for the more powerful 16/32-bit architectures, not merely moved from the 8-bit environment.

PHILON FAST/Compilers for the BASICs, COBOL, and C provide winning benchmark timings for software application systems. For example, PHILON FAST/COBOL benchmarked up to 45 times faster than leading competitors!*

But that's just the beginning.

Development time is slashed, too. Extensive and easy-to-read error messages and an interactive debugger help produce error-free code quickly and efficiently. Philon also provides outstanding detailed documentation and responsive customer support.

Find out more about PHILON FAST/Compilers. Just complete the coupon or call Bob Gildenberg, Vice President, Marketing at (212) 420-0317.

*Byte Magazine Sieve benchmark MC68000/UNIX/8mHz/1 wait state
UNIX is a trademark of Bell Laboratories.

I'd like to learn more about PHILON FAST/Compilers.

Name
Title ( ) Phone #
Company
Address
City State Zip
Computer(s)
Operating System(s) CW6-11

Philon, Inc. 50 Cooper Square
New York, NY 10003 (212) 420-0317

PHILON™ FAST/Compilers... The Speed to Succeed

© Philon, Inc. 1984

Israel launches nationwide computer-aided learning plan

By John Gallant
CW Staff

JERUSALEM — Calling it Israel's miniature fifth-generation computer project, Minister of Science and Development Yuval Ne'eman unveiled a proposed $160 million joint goverment and industry project to develop a nationwide computer-aided learning (CAL) system.

Speaking at a special briefing during the recent Fourth Jerusalem Conference on Information Technology (JCIT), Ne'eman said an alternative educational system was a most promising candidate for a collaborative national effort. Education currently absorbs more than 8% of Israel's gross national product — the largest nonmilitary share of that nation's budget.

In addition, teachers' wages are rising more slowly than those in other industries. As a result, many educators are leaving the field for more lucrative careers, and Ne'eman said the quality of national education is beginning to suffer.

"However," he said, "information technologies are maturing to the stage where they can offer a viable alternative to conventional education."

The goal of the Israeli CAL project, according to Ne'eman, is to create a turnkey learning system for the primary and secondary schools that could also be marketed to other nations facing the same educational cost and personnel pressures. During the first phase of what Ne'eman said will be a three-part program, a government-sponsored technological and economic feasibility study will be undertaken to develop alternative plans for the CAL system. Once a specific plan is adopted, the program will enter a hardware and software development phase that is expected to last four years and cost some $160 million, half of which will be funded by the government.

The CAL system will then enter the production phase, in which individual industries will be free to market products developed as part of the project.

Ne'eman said the system envisaged by proponents of the CAL program would automate not only direct teaching functions, but would also handle class record management, student evaluations, school administration and data management tasks. The key to successful implementation of the system, he added, will be the development of an effective student-machine interface.

"In the West," Ne'eman said, "it is acknowledged that information technologies will make the greatest contribution to the world economy in the next decades. Thus, a frantic race is being waged as the major nations move to develop their information industries. The competitiveness of this race may leave Israel behind if it remains passive. This CAL program is the best means to maintain and further develop Israel's relative technological strengths in the face of these international developments."

Ne'eman said Israel should not attempt to achieve technological breakthroughs requiring the substantial investments that other industrial nations can afford. Instead, "the national program has the goal of integrating information technologies into some virgin area, which involves little international activity yet presents a large economic potential. Thus, we can consider this our miniature fifth-generation computer project."

The CAL proposal is currently under consideration by the Israeli government and is expected to be approved within the next few weeks. Through financial support, he added, the government will likely encourage universities and research institutions to undertake primary research in the first phase of the CAL project.

Calif. seminars target software

TORRANCE, Calif. — A series of seminars designed for software project managers and analysts dealing with software development issues will be conducted in three California cities in June and July.

The Education Foundation of the Data Processing Management Association (EFDPMA) is sponsoring the sessions June 28-29 in Anaheim, July 12-13 in Palo Alto and July 16-17 in Los Angeles.

The full-day programs will address such questions as why most software projects don't succeed; how to estimate software costs; meeting schedules and budgets; integrating the software quality assurance function into the project plan; and selecting cost-effective software engineering development tools and methodologies.

The registration fee is $495 per person. The fee for DPMA individual members is $465. The cost for groups of three or more persons or for university and government employees is $425 each. More information is available through EFDPMA Seminars, P.O. Box 3608, Department CESD, Torrance, Calif. 90510.

In one day, we'll upgrade you from a 4300, and remove "downtime" from your working vocabulary.

We know you're tight for time, so we'll make this short.

In fact, it's your problem with time we'd like to discuss. And eliminate.

We've developed a fault tolerant, program-compatible mainframe that can take you from where you are to where you want to be, in no time at all.

IPL's 4480.

For time-saving performance, the 4480 stands toe-to-toe with the most powerful 4300 you could move up to.

For maximizing uptime, it provides complete system redundancy that maintains a majority of processing capacity when a failure strikes. No matter where the failure may be.

For rapid integration into your IBM operating environment, no other fault tolerant mainframe can match the ease and simplicity—and Day One start up—you get when you upgrade to a 4480.

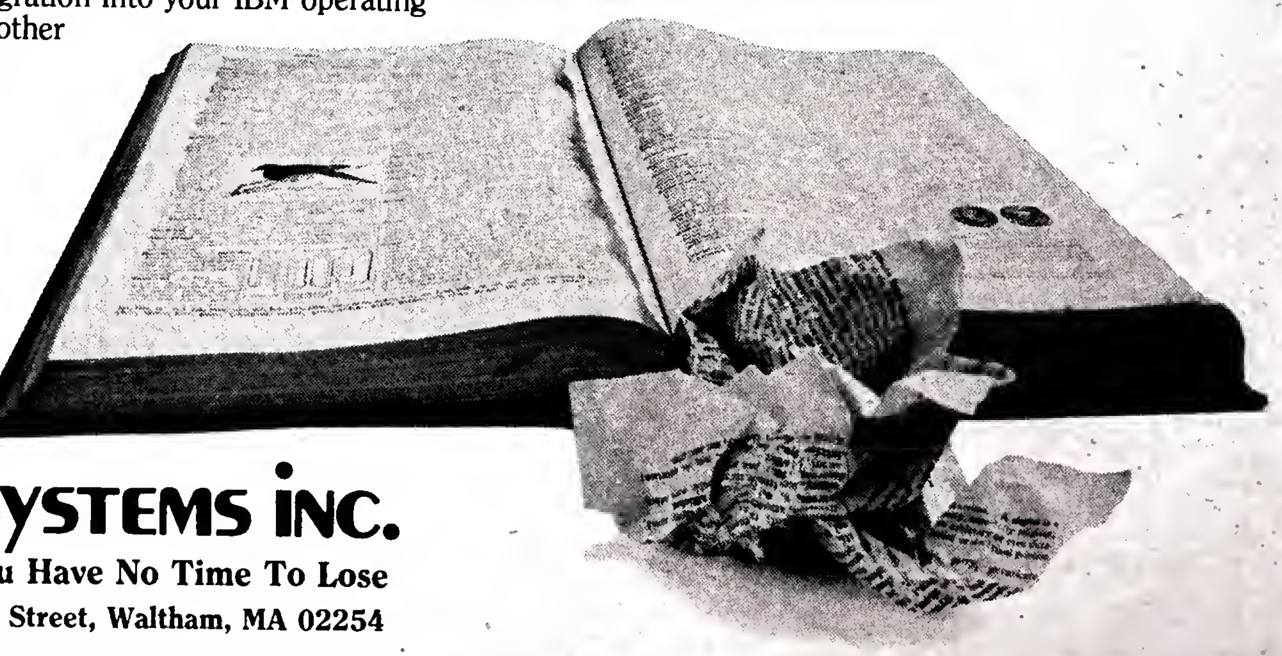
If you had the time, we'd also tell you about the 4480's unique configuration flexibility. Or point out its powerful service processor and remote maintenance capabilities. We might even introduce you to our 4460 mainfame, in its own right a powerful alternative to the high-end 4300's.

As it is, there's just enough time to mention the $100,000 price difference between the 4480 and the top-of-the-line 4300.

For all the facts about our 4480, contact George Neuman at 617-890-6620, extension 291.

When you have the time, of course.

Better yet, when you need the time.



ipl SYSTEMS INC.
When You Have No Time To Lose
1370 Main Street, Waltham, MA 02254

Firm cuts costs with micro-mainframe link, conversion

Switch from terminals to micros enhances insurance firm's communications

MILFORD, Ohio — Converting from IBM terminals and printers to IBM Personal Computers and microcomputer-to-mainframe link software has reduced data processing costs and enhanced communications for a major insurance firm here and its independent agents in five surrounding states.

Before equipping its agents with IBM Personal Computer XTs and micro-to-mainframe software last year, Midwestern Indemnity Insurance Co. leased IBM 8775 terminals and 3287 printers for more than $6,500 per terminal/printer annually. The remote terminals and printers were supported by Midwestern's IBM 4341 Model Group II mainframe, located at its Milford headquarters.

But Midwestern's agents were restricted by the limited functionality of the terminals, which lacked decision support capabilities for word processing, accounting, marketing and financial modeling and spreadsheet functions. "Our DP staff realized that the terminal system was not adaptable to the changing needs of our agents and the industry," said telecommunications specialist Frank Zore. "We wanted to provide them with comparable terminal functionality for tapping into our system as well as increased capabilities for decision support tasks.

"We also wanted a system that would allow access to outside resources, such as on-line data bases, which has become a competitive necessity in the insurance business."

Midwestern decided to investigate the option of installing micros in remote locations tied to the host system through a micro-to-mainframe link package. During its product evaluation process, Midwestern narrowed its choices to terminal emulator packages.

"The software integrators, those systems software manufacturers offering links with software on both the micro and the mainframe, required too many sacrifices in the implementation of the new system," Zore said. "Those solutions only access information in vendor-specific environments, and they would require an overhaul of our existing applications to install a new software system. The emulators offered products that could be easily incorporated in the existing network to access applications and data bases already in use."

After selecting the IBM Personal Computer XT as the micro base, Midwestern chose Pathway Design, Inc.'s Systems Network Architecture/3270 (SNA/3270) micro-to-mainframe link software and its Communications Adapter. The Midwestern system currently includes 35 micros with multiple printers and copies of the SNA/3270 software and Communications Adapter, which allow communications with the IBM host in an SNA/Synchronous Data Link Control (SDLC) environment via leased and dial-up lines.

Pathway Design's Communications Adapter is a dual-channel circuit card that plugs into the Personal Computer XT's expansion slot for network communications using SDLC, high-level data link control, Binary Synchronous Communication or asynchronous protocols. A 10-ft shielded adapter cable connects the Communications Adapter to a modem or modem eliminator.

The SNA/3270 software allows agents to access data on the mainframe and examine policies for status and payment verification, request quotes on-line and input policies. Agents can create a multitasking environment, maintaining an interactive session with the host while simultaneously printing documents. Data downloaded from the mainframe can also be captured on disk for manipulation on the micro workstation. The system provides multiple print support, host inititated printing capabilities and the ability to access a local application while maintaining a host session.

"Knowing the capabilities of the IBM Personal Computer XT," Zore said, "we realized the development of the new system would be software-driven. But when inquiring about various micro-to-mainframe products, we encountered plenty of hype about communications links, but little that was actually available. The SNA/3270 system, on the other hand, met our requirements, and it has solved some very real problems."

SYNAPSE. A CLEAR ALTERNATIVE TO IBM AND TANDEM.

FOR THE BUSINESS TECHNOLOGIST WHO WANTS TO BUILD ONLINE DATABASE TRANSACTION PROCESSING SYSTEMS, SYNAPSE STARTED WITH A CLEAN SHEET OF PAPER—AND ENDED UP WITH THIS:

ACCELERATED AND ECONOMICAL APPLICATION DEVELOPMENT:
- Database concurrency, integrity and recovery are fully automated.
- Batch programming skills are adequate for development of online systems.
- Relational database navigation is completely independent from programs, and all data is independent of programs and screens.
- The application methodology and environment let users quickly translate their business requirements into online computer solutions.
- The communications system is powerful and terminal-independent.
- The system command language and batch facilities are unmatched in the industry.

APPLICATION AVAILABILITY AND INTEGRITY—BEYOND MERE HARDWARE FAULT TOLERANCE—FOR THIS UNPRECEDENTED INTEGRATION OF SYSTEM-WIDE FAULT TOLERANCE:
- Application software integrity and recovery are achieved without any required application programming.
- Because all system maintenance tasks may be performed while the system is in production, the application is available 24 hours per day, 7 days per week.
- SYNAPSE N+1™ architecture not only permits recovery from multiple processor failures, with no human intervention—but also lets all processors fully contribute to transaction throughput.
- Data integrity is the top system priority.

GRACEFUL GROWTH AND CONFIGURABLE PERFORMANCE:
- Performance increases linearly with the addition of processors online and under power, and yields the most transactions-per-second-per-dollar in the industry.
- The advanced Synapse multi-processor architecture expands system power linearly in low-cost increments, from supermini to largest mainframes, in one cabinet (42" wide).
- A unique software architecture automatically scales up with increasing database concurrency and growth.
- Relational database performance is achieved through access acceleration and an active, system-wide APPLICATION DICTIONARY™ facility.
- Hardware and software growth is transparent to application programs and requires no application redesign, complex tuning or load balancing.
- Integration of the Transaction Processing Manager into the operating system eliminates bottlenecks traditionally found in systems dependent upon the requester-server model.

SIMPLICITY AND EFFICIENCY OF OPERATIONS:
- The system may be in production 24 hours per day, 7 days per week, because the following may be securely and efficiently done during production.
  - Backups • Database reorganization
  - Reconfiguration and growth
  - Maintenance • Development • Batch processing
- Program modules can perform in either a batch or an online environment.
- Menu-driven system security is flexible and easy-to-implement.
- Batch processing is flexible and high- performance.

What Synapse has created is a truly unique option. Totally integrated online database transaction processing—from hardware to software to application. With an architecture that combines 3081 performance, System/38 simplicity, Tandem availability, and a painless-growth capability that's beyond anything else.

You can confirm all this for yourself in just a half day at one of our demonstration centers. You can walk in and build your own online database, screens and application unit. Then walk out with program listings and samples of output.

Knowing that, while there's now an alternative to IBM and Tandem, there clearly isn't one to Synapse.

© 1984 Synapse Computer Corporation. SYNAPSE N+1, and APPLICATION DICTIONARY are trademarks of Synapse Computer Corporation. Patents pending.

Synapse
Computer Corporation
THINK AHEAD.

Mail to: Synapse Computer Corporation
Corporate Communications Department
801 Buckeye Court, Milpitas, CA 95035
(408) 946-3191
☐ Please send me more information.
☐ Please call me to schedule a demonstration.
Name Title
Company Phone
Address
City State Zip

Call (408) 946-3191 for an invitation to our NCC hospitality suite. Or plan to attend the 3:20 pm Monday afternoon NCC "MULTI-PROCESSING SYSTEMS" technical session #218, where we will present a paper on our multiple-processor, shared-memory architecture.

Firm's compression needs prompt software search

Blue Cross/Blue Shield gains cost savings on disks and better security

COLUMBIA, S.C. — In conducting 500,000 transactions each day, Blue Cross/Blue Shield of South Carolina was using up many disk packs to store its files. Wayne Roberts, director of DP operations, was looking for a way to compress files further.

From its own compression file, which simply took out blanks in lines of data, the DP organization was achieving a 40% compression rate. But more compression was needed, so the medical insurance company began shopping for software.

Blue Cross operations in other states had been using Shrink, a data compression system from Informatics General Corp. of Canoga Park, Calif. Roberts tried three programs and concluded Shrink had the most advantages.

"The basic reason we went to that piece of software was we saw it as a way to save a lot of money on disk packs. It turned out that it did just that," Roberts said.

Blue Cross/Blue Shield of South Carolina has saved more than $1 million to date, or $40,000 each month, since installing the system in October 1981, Roberts said. The software has provided average shrinkage of 75%, he said. Shrink runs on the company's one IBM 3081 Model Group K mainframe, with 32M bytes of memory and 24 channels, along with 44 IBM 3350 and 15 IBM 3380 hard disk drives.

Employing nearly 1,200 people, Blue Cross/Blue Shield of South Carolina administers claims for 41% of the state's population. The sole Blue Cross/Blue Shield plan in the state also administers government contracts, including Medicare for South Carolina, and Champus for military retirees and dependents in six states and the District of Columbia.

Microcomputers are also used extensively by Blue Cross/Blue Shield of South Carolina. The company has IBM Personal Computers and Personal Computer XTs installed in all South Carolina hospitals, throughout the Blue Cross/Blue Shield complex itself and in many doctors' offices throughout the state. Blue Cross/Blue Shield's DP operations division is staffed with 45 professionals. With such a complex, the average response time on the 500,000 daily transactions is less than half a second.

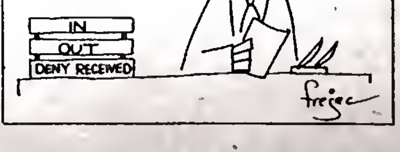
The DP department's Performance Analysis Group now routinely reviews files for possible compression. According to Roberts, Shrink has been used with a variety of files since it was installed. "We use it primarily on direct-access disk files. During the first four or five months of use, we compressed our largest files — every direct-access file consisting of more than 100 cylinders. We found that cost savings were maximized by staying away from sequential files with Shrink."

The company's largest claims history file of nearly two million claims, or more than five million records, Roberts said, was compressed by 75% with Shrink. This major file, he said, resided on 10 IBM 3350 disk packs. According to his calculations, the file would have taken up at least 30 additional packs had it not been compressed.

"Overall, we have compressed the equivalent of 108 3350 packs, a savings of more than 81 packs," Roberts said. The savings of $40,000 per month is based on the 1984 price of 3350 disk drives, he noted.

"We've found Shrink to be extremely beneficial for backup and restore jobs," he added. "Since files are compressed by such a high percentage, record size within files has been reduced. Consequently, all of our backup and restores to these files run significantly faster and use less CPU time."

Better security is a byproduct of Shrink, Roberts said. The software encodes each file that is compressed with a file description table. Unauthorized users are unable to read encrypted files.



The Solution.
Dial-Up 3270

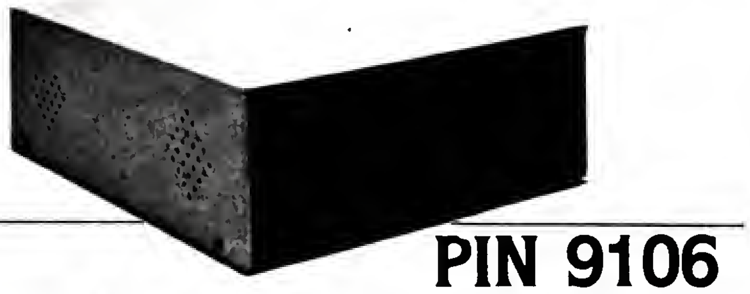
LineMaster An intelligent device for dial-in access to your mainframe 3270 Bisync line. **LineMaster** is a communications watchdog which keeps a line in service until a user dials in.

- For any remote 3271/4/6 line—up to 19.2K baud.
- Compatible with any 3270 BiSync emulator including microcomputers.
- Connects between modem and mainframe.
- Installs in minutes.

$639.

MicroFrame, Inc.
205 Livingston Avenue
New Brunswick, NJ 08901
(201) 828-4499

New error correcting
Stat Mux
for the asynchronous world



PIN 9106

☐ Provides error correction and line savings for distributed async minicomputer networks
☐ Two async channels up to 9600 bps or four at up to 4800 bps
☐ Sync or async composite runs up to 9600 bps
☐ Answer control compatible with 212 modems
☐ Menu driven parameter selection
☐ Hardware and software flow control
☐ Down-line loading of parameters and echoplex
☐ **ALL AT TREMENDOUS SAVINGS**

Call 312-541-6060 for details today.

gandalf™
Gandalf Data, Inc./1019 S. Noel Ave./Wheeling, IL 60090/TWX: 910-651-4951

TP DATA STREAM
COMPRESSION
CTOP® – the CICS Transmission Optimizer

- Extends capacity of entire network
- Instantly improves CRT and printer response
- Reduces line busy and front-end loads
- Gives new life to slower circuits
- DOS, VSE, VS1, MVS, BTAM, TCAM, VTAM
- Over 500 users

For more details on CTOP® call: (208) 377-0336

HW™ *H&W COMPUTER SYSTEMS, INC.*
P.O. BOX 4785 • BOISE, IDAHO 83711-4785

LEARN CICS
THIS SUMMER

COURSE	JULY	AUGUST	SEPT
APPLICATION DESIGN	NYC 7/16-19	DAL 8/13-16	NYC 9/4-7
COMMAND LEVEL PROGRAMMING	NYC 7/9-13	NYC 8/6-10	NYC 9/17-21 CHI 9/24-28
COMMAND LEVEL INTENSIVE (2 wknds)			NYC 9/22-23 9/29-30
DEBUGGING		NYC 8/27-30	
INTERNAL ARCHITECTURE	SF 7/30-8/3		NYC 9/17-21 DAL 9/24-28
INTERNAL ARCHITECTURE INTENSIVE (2 wknds)			NYC 9/8-9 9/15-16

Not all CICS courses are alike. Only SysEd prepares reference manuals full of real life sample programs and case studies—the kind you'll need and use long after you've taken the course. Only SysEd has fully equipped Computer Labs where you'll spend hours in workshop sessions actually programming CICS on a 3081 computer using 3270's dedicated to the class. Classes are held in major cities. SysEd course offerings are also available for on-site sessions at company installations. On-site courses can include the same case studies and hands-on approach as our public courses, or can be customized to your particular application or project. So get smart this summer, call David Shapiro (212) 564-9147.

SYS-ED™
35 WEST 35 STREET, NEW YORK, NY 10001 • (212) 564-9147

Coke bottler lauds multiuser micros; paper glut reduced

ST. LOUIS — The financial department of the Coca-Cola Bottling Co. of St. Louis has put the power of multiuser microcomputing to use for everything from word processing to financial analysis, eliminating what had before been a bottleneck of paperwork.

Before the arrival of the financial office's multiuser system in October 1982, the department's accountants were doing their calculations with hand-held calculators. The department's daily sales analysis took half a day to prepare; it now takes 30 minutes.

The credit for these improvements, according to the department's director, Frank Kohring, goes to the department's Fortune Systems Corp.'s 32:16 multiuser microcomputer, a system configured with seven Fortune terminals, a NEC Information Systems, Inc. letter-quality printer and a Centronics Data Computer Corp. dot matrix printer. The system will take a leap forward soon, Kohring said, when it gains communications linkage with the bottler's new IBM System/38 Model 7, scheduled to come on-line this week and house the firm's entire data base.

Advantage of computing

One of the biggest advantages of the adoption of computing in his department, Kohring said, was that it gave the staff the chance, for the first time ever, to conduct market analysis. "Now, with the computer doing all the paperwork fast and accurately, we actually have time to think about current activities and plan future strategies," he said.

"What's more," he continued, "computing capital expenditures to determine our return on investment can be accomplished with the system in one-fourth the time."

Kohring, who also serves as the firm's controller, said the system has sped his department's tracking of the firm's raw materials. "We're in a highly competitive industry, and things could change rapidly," he explained, noting that a "penny or two of difference" in the price of sweeteners or packaging materials can make a big difference to a firm ranked 12th among Coca-Cola's U.S. bottlers. The system's global search capability also allows the accounting group to update cost changes instantly for individual raw materials via simple keyboard commands.

The bottling firm, a subsidiary of Navarre Corp. in Chattanooga, Tenn., uses the microcomputer to prepare monthly consolidated financial statements on the bottling franchise here and a Navarre-owned luxury hotel in the Florida Keys. In addition, the financial department maintains records and produces reports on notes payable, monthly debt service, cost accounting contributions of various products, return on company investments and payroll.

Kohring said the Fortune system was chosen over models produced by Apple Computer, Inc. and Digital Equipment Corp. because "Fortune was the only truly multiuser unit available" in the 16- to 32-bit category of microcomputers. No employees were replaced by the machine, he said, adding that his department "would probably have two to three more people" had the system not been purchased.

Although the company's data processing department has operated a computer for 15 years — most recently, an IBM System/3 Model 15D — the system offered only limited use to the financial group on a day-to-day basis. "The DP programmers were expert at handling functions such as printing invoices, sales registers and general ledgers — tasks that are done repeatedly and in the same order — but our needs varied and required a good deal of data input and program customizing," Kohring maintained. "We constantly had to wait in line for programmer time, plus time-sharing on the large system can be quite expensive."

A multiuser system was essential in setting up a comprehensive, team approach in the financial department. Because the Fortune system incorporates 20M-byte hard disk storage, up to five users can tap into a data base simultaneously.

"We needed the networking and file access Fortune offered, so the multiuser capability proved very attractive to us," Kohring said. "In contrast, with a smaller floppy disk-based micro, if three people want to use the same information, someone ends up waiting around."

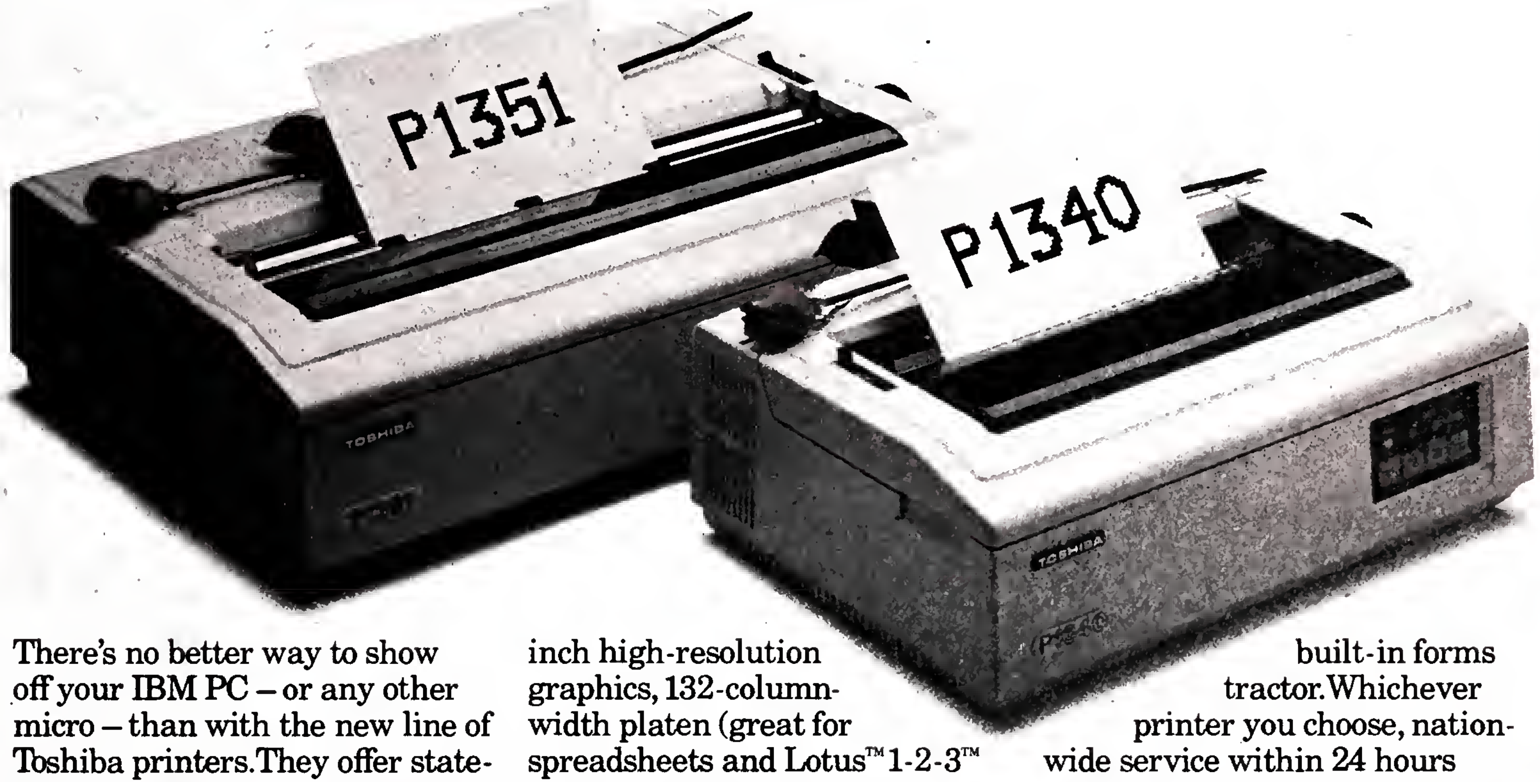
The Fortune 32:16 is equipped with five ports, one for the CPU and the remainder for satellite terminals. By using a phone switch to connect terminals to the computer, the financial department was able to expand the total number of end-user workstations to seven.

Had the bottling company opted to buy several separate micros instead of the Fortune system, not only would networking and simultaneous file accessing be unavailable, the cost would have been much greater, the controller said.

Though the micro was his first experience using a computer, Kohring finds the workstations remarkably easy to operate. The master terminal

See **BOTTLER** page 54

Two ways to show off your IBM PC.™



There's no better way to show off your IBM PC – or any other micro – than with the new line of Toshiba printers. They offer state-of-the-art features, high reliability and low price.

P1351

The new Toshiba P1351 printer has a unique high-density 24-pin dot-matrix print head. It lets you print crisp, clean letter copy at 100 cps, draft copy at 192 cps. And with the software-selectable downloading fonts, you get to pick from a variety of type styles.

The P1351 has more stuff to show. Like 180 x 180 dots-per-inch high-resolution graphics, 132-column-width platen (great for spreadsheets and Lotus™ 1-2-3™ data processing and graphics), Qume SPRINT 5™ emulation, and a choice of either a forms tractor or automatic sheet feeder.

P1340

For considerably less, the new P1340 gives you just a little less. But it still has the same high-density 24-pin dot-matrix print head, the 180 x 180 dots-per-inch graphics resolution, and the Qume SPRINT 5 emulation. In addition to true proportional spacing and a built-in forms tractor. Whichever printer you choose, nationwide service within 24 hours by Western Union technicians is available.

So the choice is yours. But when you choose Toshiba, you know you're putting on the best show possible.

For more information, call toll-free: **1-800-457-7777**, Operator 32.

IBM PC to P1340 and P1351 graphics utilizes PaperScreen and the IBM PC with color graphics adapter. IBM PC is a trademark of International Business Machines. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. SPRINT 5 is a trademark of Qume Corporation.
© 1984 Toshiba America, Inc.

In Touch with Tomorrow
TOSHIBA
Information Systems Division, TOSHIBA AMERICA, INC.

Software International
Understands That Human Resource Managemen

That's why Software International® Financial and Personne

Requires a Special Touch.

Introducing the Software International Payroll/Human Resource Management System. The true on-line, real-time system that puts you in control.

Imagine . . . human resource capabilities for compliance reporting, salary and benefits administration, applicant tracking, position control, manpower planning and development, "what if" modeling and much more.

Then, discover the payroll module for direct terminal-based control over paycheck processing, tax changes, establishment of new earnings types plus deductions and reports. You have access to all on-line information through an easy-to-use English language query facility.

Access to sensitive human resource and payroll information is controlled by one of the industry's most advanced data security subsystems.

The Payroll/Human Resource Management System is just one of the advanced financial and human resource management software packages available from Software International. We have nearly two decades of experience in doing one thing with exceptional expertise: providing better applications software for mainframe and minicomputers.

When human resource professionals want to run better, they run with us.

Call or write:
Software International Corporation
One Tech Drive
Andover, MA 01810
1-800-343-4133
In Massachusetts **1-800-322-0491.**

Software International is a wholly-owned subsidiary of General Electric Software Products Company.

SOFTWARE
INTERNATIONAL

Run With Us

Software Packages are running in over 5000 installations.

Tool inaugurates software firm's system upgrade

Applications generator enables vendor to upgrade its telemarketing system

BELLEVUE, Wash. — An applications generator for Digital Equipment Corp. VAX-11 superminicomputers has helped a major microcomputer software company here take the first steps toward upgrading its telemarketing system.

The software is expected to play a significant role in what will ultimately be a "very sophisticated telemarketing environment," according to Nancy Mitchell, telemarketing director for Microsoft, Inc. Microsoft is the manufacturer of a variety of microcomputer software packages, including the MS-DOS microcomputer operating system.

When Mitchell decided to computerize completely Microsoft's telemarketing system, she consulted Neil Evans, manager of information systems, for advice on purchasing an applications generator that would run on the company's VAX-11/780. In addition to her immediate need for an application to link telemarketing to an order entry system, which would require split-screen capacity, Mitchell wanted a product with enough flexibility to allow for the future integration of telemarketing with other business applications.

Because Microsoft's business systems resided on the DEC system, Mitchell's first step was to transfer the company's dealership data base from its single-user Ashton-Tate Dbase II software on an IBM Personal Computer to a multiuser application on the VAX-11/780. After reviewing a variety of applications generators, Evans recommended Smartstar from Signal Technology, Inc. of Santa Barbara, Calif.

After selecting Smartstar, Evans set about loading Microsoft's 5,000-plus dealership data base into that software on the VAX-11. "We loaded the data automatically from two different places: We took some data out of our business systems and also out of the Dbase II application and uploaded it from the IBM Personal Computer into Smartstar." He said the automatic loading process saved Microsoft as much as 250 to 350 hours of data input time. Evans designed the application form with Smartstar and had the system functional in only two days. No programming was used at all.

Microsoft presently has its total customer base on Smartstar, according to Evans. Using a communications package, 15 of the IBM Personal Computers function as DEC VT100 terminal emulators, allowing the company to run micro software products, such as Microsoft's Multiplan and its word proccessing package, and also access its business system. That, he said, eliminated the need for micros and terminals. The Smartstar package also integrated easily into the VAX-11 architecture.

As a result of the conversion, Mitchell has gained multiuser access to telemarketing data. She looks ultimately to a fully integrated system, interfacing Microsoft's dealer base and its sales customer base with an order entry application. Currently, Smartstar is used as a marketing tool, aiding in the analysis of customer hardware and software inventories and allowing Mitchell to target telemarketing efforts more effectively.

BOTTLER from page 51

is run by the general accounting manager, who makes sure that all information is backed up on floppy disks twice a week. In addition, two terminals outside the financial department — one in the president's office, the other in data processing — also hook into the main data base.

The company bases its financial reporting systems on a schedule in which each quarter year is divided into segments of four, four and five weeks. The department closes the company's books at the conclusion of each segment — or 12 times per year — a process that used to require six full work days to complete.

"I can now come to the office, start keying in budget information and, in about 10 minutes, the computer will give me a flash or rough estimate within $25,000 to $50,000 of what our quarterly net profit will be," Kohring said. "This data also gives our president a good idea of how well the company performed."

The flash analysis of a monthly reporting period can also directly affect marketing and promotional decisions. "If production expenses are too high, we know it an entire week sooner than before and can immediately take steps to solve the problem," he said. "Because we produce consumer products, we must respond quickly to changes in the marketplace.

"The flash analysis also helps guide our pricing policies and marketing strategies and lets us know if we have a budget problem," he continued. "We simply could not do any of this analysis before the computer was installed."

Automation helps ironworks survive in tight economy

HILLSIDE, N.J. — Based in an area hard hit by competition from other American and Canadian steel producers, one of the few survivors in the New Jersey steel fabricating industry is counting on automated production and office procedures.

Part of that automation effort at Interstate Iron Works Corp. is a minicomputer that helps company officials manage work-in-progress costs and process payrolls. The mini was installed in August 1983, about the time Interstate's owners, cousins Robert and Stephen Abramson, renovated the firm's production area, installed materials-handling equipment and added computer-controlled production equipment.

Robert Abramson noted that while the modernization raised the firm's production capacity from 3,000 to 14,000 tons per year, accurate job estimates were crucial to being successful in bidding for and erecting the steel skeletons of commercial buildings. "This is a business where percentage points in estimating can make the difference," he noted. "If you bid a job low, you'll be held to that bid and lose money on the job. The plant modernization helped bring our fabrication costs in line with competition, but we needed some way to get a handle on costs for each operation."

Interstate Iron Works' Adds Mentor 3000

The nature of Interstate's business — fabrication and erection of steel — means that 30 shop workers may do 30 different operations on five different jobs daily for a total of 150 different labor calculations. The company may use another 10 to 50 site workers from four different unions. All of that complicates statistics management and the payroll.

The Abramsons replaced an IBM 5110 small business system with an Applied Digital Data Systems, Inc. (Adds) Mentor 3000 minicomputer, now equipped with seven Adds Viewpoint terminals. "We had accounting and some payroll applications on the older computer, but we never elected to put cost accounting on it. The computer was so slow that it would be a full-time operation just to do the payroll. The cost accounting would be just too much," said Robert Abramson.

The Abramsons use the Mentor 3000 from Adds, a subsidiary of NCR Corp., and customized software from EDP of America, Inc., a systems development firm in Cranford, N.J. The system runs the Pick & Associates, Inc. Pick operating system.

Interstate uses the $40,000 system to run its payroll, calculating individual payments and writing checks, and to convert the data into report form. Robert Abramson reported that he uses the payroll data to create job-cost management reports on demand. He said that allows management to control costs by comparing dollars spent with dollars estimated and by tracking commitments. He compiles estimates for bids using that data on a Hewlett-Packard Co. HP 85 micro.

He added that the English-like commands of the Pick operating system help him track day-to-day costs by job, labor classification, function, plant group or any of many other parameters.

"By better tracking my costs, I can get a better feeling of how to bid the work. I can be more competitive when I have advantages over other fabricators. So the computer not only acts like a tool to maximize my profits, it also acts as a tool to get more work," he said. The computer is probably the easiest purchase to cost-justify, he added. " If we were to prepare the payroll manually, it would take days rather than the minutes it now takes with this machine. More than that, the company's volume has more than doubled, and we still have the same three-person office staff. However, the biggest justification is its value as a management tool. Our ability to grow in the face of a starving economy is partly due to the computer."

THE LEASED MODEM.

IT ELIMINATES THAT LOCKED-IN FEELING.

Why lock yourself in with a purchase, when you could lease and be free to up-date?

That's a question a lot of people are answering by leasing their modems from General Electric.

Consider the plusses:

You get your choice of today's most advanced equipment. Quick availability from manufacturers like Racal-Vadic, General DataComm, Paradyne and Ven-Tel.

You can trade up to *new* equipment at any time without penalty—instead of living with hardware that time has passed by.

Your lease is backed by GE *service*—a one-company nationwide network that knows your equipment cold.

You get the tax-savings and other advantages of *leasing*—to keep your accountants happy.

Plus, you're dealing with a company you can *count* on. Immersed in virtually every area of telephone and data communications technology. And in business to stay.

Don't buy another modem until you've talked leasing with GE.

We've got the key to set you free.

General Electric Company, Integrated Communication Services Operation, Communication Leasing, Building 4, Room 210, Schenectady, New York 12345.

Schenectady	(518) 783-4650
Atlanta	(404) 452-4926
Chicago	(312) 780-2994
Detroit	(313) 285-6700
New York City	(201) 227-7900
Houston	(713) 741-9646
Los Angeles	(213) 642-5317

GENERAL ELECTRIC

NEWS

Trucker tracks supplies with computerized inventory

ATLANTA — Rollins, Inc. brought on-line in January a computerized inventory control system to track the oil field pipe and supplies stored and shipped by one of its subsidiaries, Patterson Truck Line, Inc.

The system "gives Patterson Trucking a competitive advantage" and allows Patterson to know of a change in its inventory "at the moment that it happens," explained Rollins' Group Vice-President Clint Greer, who oversees the firm's information systems department.

Patterson Truck Line stores the pipes, tubes and casings at three supply yards in the Southwest. The pipes are owned by oil drilling firms or by manufacturers who use the hauler to store and often inspect and maintain the pipes until they are needed.

The way it works

At that time, the driller calls the Patterson supply yard nearest the drilling site and places an order with a data entry clerk. The order is entered on an IBM 3270 terminal and transmitted to the inventory control system's mainframe host, an IBM 3033S with 12M bytes of internal memory, located at Rollins' data processing center in Atlanta.

The host, which acts as the storage site for all of Patterson's supply yard inventory data, records the order and returns it to the supply yard via an IBM Series/1 minicomputer, located at a Patterson supply yard in Houma, La.

At the supply yard, the orders coming back from the mainframe are received over phone lines by small, hand-held MSI, Inc. Model 88 data entry terminals, which the yard's workers take with them as they go about filling the orders.

The orders must go to the Atlanta mainframe and back, explained Steve Cunningham, Rollins' system and programming director, because trucks to haul the shipment may need to be dispatched from other Patterson locations and because the control system needs the large data storage and processing capacity. The Series/1 unit acts as a protocol converter to translate the Synchronous Data Link Control (SDLC) protocol of the mainframe into the asynchronous protocol used by the hand-held terminals.

The hand-held terminals are used in the yard to display the order and, as it is filled, to record the changes in the yard's inventory. The inventory data from the terminals is periodically uploaded to the host, again over phone lines, and the host provides each yard with a summary of its daily inventory via the yard's IBM 3278 or 3178 terminals and IBM 3287 printer.

When the shipment leaves the yard by truck, the freight bill is printed by the system, and charges for transportation — and storage or inspection, if any — are automatically added to the customer's invoice, which is generated later.

Most of the on-line software was custom-written by Rollins for the system, using IBM's Applications Development Facility. The IBM mainframe's data base is IBM's IMS — using both physically paired and bidirectional logical relationships — and the hand-held terminals use a program written in Basic and burned into their programmable read-only memories, Greer explained.

The IBM Series/1 looks to its host like an IBM 3274 control unit with five IBM 3278 terminals. Communications between the minicomputer and the host is handled by IBM's Systems Network Architecture (SNA) and the SDLC protocol.

The software in the IBM Series/1 is IBM's Communication Facilities and SNA support using the Event Driven Executive operating system. The packages were customized to do this application. The main purpose of this software is to convert the asynchronous RS-232 protocol used by the MSI terminals to the SNA protocol used by the host.

The IBM 3278 and 3178 data terminals communicate directly with the host via IBM 3274 control units and point-to-point and multidrop lines.

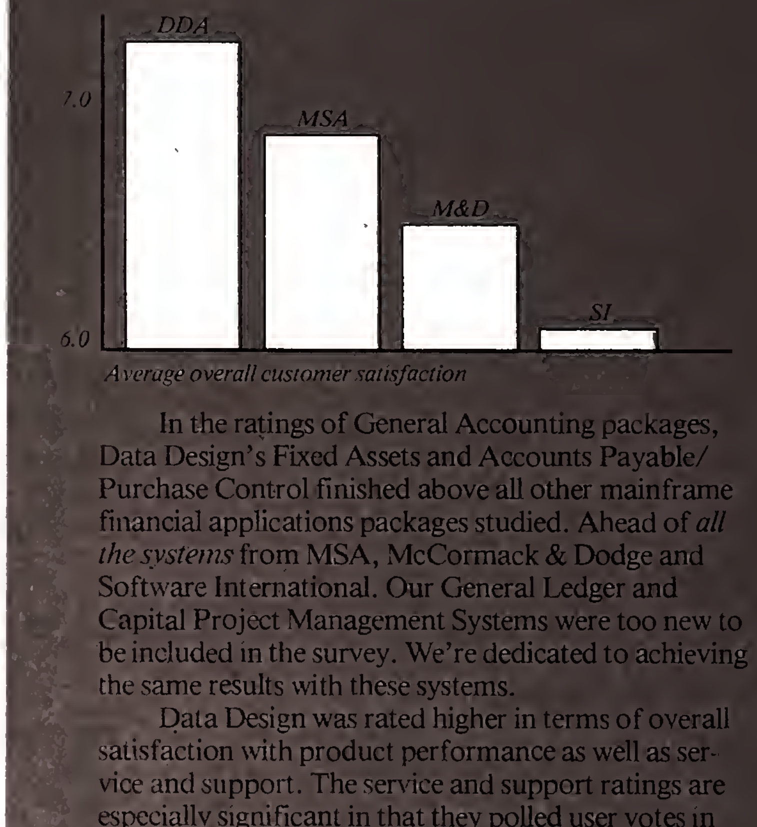
If ever a problem would develop anywhere within the network, an operator from Rollins' data center can pinpoint it in a matter of minutes.

MSI's hand-held Model 88 in use at Patterson Truck Line's pipe terminal

David Beats Goliath. Again.

Data Design's Financial Software Packages Top Datamation Survey...

The results of the latest *Datamation* software survey have been released. They make interesting reading. Especially if it's your job to secure financial applications software packages for your company.



In the ratings of General Accounting packages, Data Design's Fixed Assets and Accounts Payable/Purchase Control finished above all other mainframe financial applications packages studied. Ahead of *all the systems* from MSA, McCormack & Dodge and Software International. Our General Ledger and Capital Project Management Systems were too new to be included in the survey. We're dedicated to achieving the same results with these systems.

Data Design was rated higher in terms of overall satisfaction with product performance as well as service and support. The service and support ratings are especially significant in that they polled user votes in the categories of vendor responsiveness, training and documentation—areas critical to trouble-free system operation. Data Design has consistently been rated the best in these categories in nationally recognized independent software surveys, and accordingly, finance and accounting managers at hundreds of major corporations have found they can rely on our financial software systems.

Our reputation for excellence has been built on years of providing the highest quality mainframe software for:

☐ **General Ledger Financial Control**
☐ **Accounts Payable/Purchase Control**
☐ **Fixed Asset Accounting**
☐ **Capital Project Management**

To learn how these systems work for a broad range of medium to large size companies on most major computer systems, call today at 800-556-5511 (408-730-0100 in California), or complete and mail the coupon below. If you do, next year you'll be able to rate your software vendor "number one," too.

DATA DESIGN ASSOCIATES

1279 Oakmead Parkway, Sunnyvale, CA 94086

Please send me additional information on your:
☐ **General Ledger System**
☐ **Accounts Payable/ Purchase Control System**
☐ **Fixed Asset Accounting System**
☐ **Capital Project Management System**
My need is: ☐ Immediate ☐ Short Term ☐ Long Term
☐ I am interested in attending a free seminar on financial application software.

Name ___
Title ___
Company ___
Address ___
City, State, Zip ___
Telephone ( ) ___
Computer Brand ___ Model ___

CWD 3

ONLY 76¢ A WEEK

So much, for so little . . . and all yours, as part of your COMPUTERWORLD subscription.

51 issues of **COMPUTERWORLD** plus special issues throughout the year including:

Computerworld OA—*incisive coverage about office automation*

Computerworld On Communications—*keep current with the rapidly changing communications field*

Computerworld Buyer's Guides*—*product-specific lists and latest information in major product areas*

With this order form, you pay only $39 (just 76¢ a week). That's a $5 savings off the basic annual rate of $44, an offer too good to pass up.

Now, get everything that's coming to you—Subscribe Today.

Complete Form On Reverse,
Then Return In Attached
Postage-Paid Envelope. Or Use Your
Charge Card and Call
TOLL-FREE: 1-800-343-5730.

☐ **Please enter my subscription (details on back)**

☐ **I'm already a subscriber, but I'd like you to change my:**

☐ **address** ☐ **title**
☐ **industry** ☐ **other**

My current mailing label is attached and I've filled in new information on the other side.

Put old label or label information here

COMPUTERWORLD

U.S. Only

CW-139

Please send me COMPUTERWORLD for one year. RATES: United States ~~$44;~~
Canada, Central & South America $110; Europe $165;
All Other Countries $245 (Airmail Service)

Special Introductory Offer — Only $39.00 Save $5.00

☐ Check Enclosed
☐ Am.Ex ☐ BA/Visa ☐ MC (MC Only List four digits above your name)

If charge we must have cardholder's signature ____________ Expiration Date: ____________

First Initial ☐ Middle Initial ☐ Surname ____________
Your Title ____________
Company Name ____________
Address ____________
City ____________ State ____ Zip Code ____________

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld.*

☐ Check here if you're interested in receiving information on *Computerworld's* Index.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
CIRCULATION DEPT. 375 Cochituate Road, Rte. 30, Box 897,
Framingham, MA 01701-9985

Detach here, moisten and seal envelope securely before mailing.

1. **BUSINESS/INDUSTRY (Circle One)**
   End Users
   - 10 Manufacturer (other than computer)
   - 20 Finance/Insurance/Real Estate
   - 30 Medicine/Law/Education
   - 40 Wholesale/Retail Trade
   - 50 Business Service (except DP)
   - 60 Government—State/Federal/Local
   - 65 Public Utility/Communication Systems/Transportation
   - 70 Mining/Construction/Petroleum/Refining
   - 75 Other User ____________

   Vendors
   - 80 Manufacturer of Computers, Computer-related Systems or Peripherals
   - 85 Computer Service Bureau/Software/Planning/Consulting
   - 90 Computer/Peripheral Dealer/Distributor/Retailer
   - 95 Other Vendor ____________
2. **OCCUPATION/FUNCTION (Circle One)**
   - 11 President/Owner/Partner/General Manager
   - 12 VP/Assistant VP
   - 13 Treasurer/Controller/Financial Officer
   - 21 Director/Manager/Supervisor DP/MIS Services
   - 22 Director/Manager of Operations/Planning/Administrative Services
   - 23 Systems Manager/Systems Analyst
   - 31 Manager/Supervisor Programming
   - 32 Programmer/Methods Analyst
   - 35 OA/WP Director/Manager/Supervisor
   - 38 Data Comm Network/Systems Mgmt
   - 41 Engr/Scientific/R&D/Tech Mgmt
   - 51 Mfg Sales Reps/Sales/Marketing Mgmt
   - 60 Consulting Mgmt
   - 70 Medical/Legal/Accounting Mgmt
   - 80 Educator/Journalist/Librarian/Student
   - 90 Other ____________
3. **COMPUTER INVOLVEMENT (Circle all that apply)**
   Types of equipment with which you are personally involved either as user, vendor or consultant
   - **A.** Mainframes/Superminis
   - **B.** Minicomputers/Small Business Computers
   - **C.** Microcomputers/Desktops
   - **D.** Communications Systems
   - **E.** Office Automation Systems

CW-139

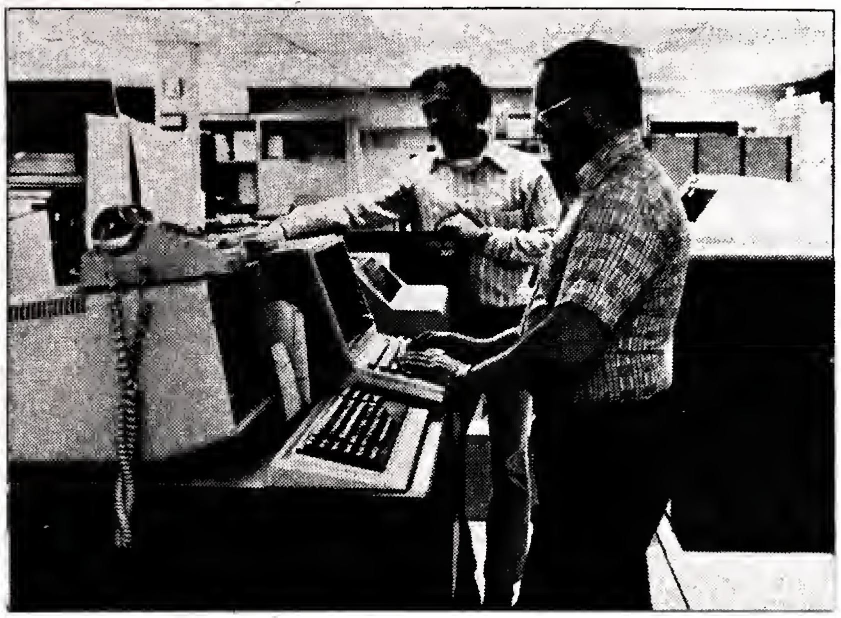
University forced to make quick systems decision

After learning support for its leased Series 90 equipment had been canceled

BOONE, N.C. — Three years ago, Appalachian State University here was caught in a race against the clock. Sperry Corp. had just announced it no longer planned to support its Series 90 mainframe line, and the university, which leased a 90/80 processor, was forced into making a decision.

University officials said there was not enough money immediately available to buy a new system, recalled Ernest L. Jones, director of the university's computer and management services.

There were five years remaining on the Sperry lease agreement for the 90/80, but, after that, it was clear the university would have to convert to another system.



Operator enters instructions into Sperry's 1100/62 Attached Virtual Processor at Appalachian State University.

Sperry proposal

"We decided to go with our present contract until it ran out and then go out for bids," Jones said. But before the contract expired, Sperry presented the university with a proposal that offered the chance to install a new system without making a major increase in monthly payments.

According to Jeff William, a systems manager at the university, Sperry offered to install a Sperry 1100/62 mainframe with the then newly announced Attached Virtual Processor (AVP).

The processor is a special-purpose CPU that operates in a multiprocessor 1100/62 environment. When configured into an 1100/62, it enables the programs written for the VS/9 operating system, under which the 90/80 computer runs, to be executed concurrently with Series 1100 operating system applications, Jones explained.

While the university would have owned the 90/80 when its lease contract expired, it still would have been faced with a conversion to another system. By waiting for the contract to expire, selection of a new system would have been delayed by at least three years.

Furthermore, Jones said, if the university decided to acquire a system not capable of running VS/9 programs, the school "could have had two different systems without the ability to fall back on one if we needed to." That situation would have meant the purchase of new equipment in 1986 and continued maintenance of the 90/80 until 1988.

Making the conversion to the Sperry processor last August was not done without apprehension, particularly since Appalachian State was one of the system's first users, Jones recalled.

The university's processing load is fairly heavy, and though activity averages 40% academic, 40% administrative and 20% public service, there are surges at certain times of the year. Therefore, the university planned to move all applications onto the processor at one time and get rid of the 90/80.

But that plan put "too much pressure on the school," which had about 50 teletypewriter terminals and 44 Sperry UTS 40 multidrop inquiry terminals on IMS/90 at the time, Jones said. Instead, Jones decided to take a go-slow approach to conversion.

The event that convinced him to take that approach occurred one afternoon when, for a couple of hours, he suspended administrative applications on the 90/80 and allowed the academic jobs to be processed alone. The academic work was processed in short order with excellent response time, he said.

As a result, it was decided to convert administrative and public service operations first. The 90/80 would continue to handle academic jobs through August 1985. The system is expected to be totally converted to the 1100/62 beginning with the fall 1985 semester.

Mapper's assistance

Where possible, software development necessary in the conversion will be performed with the aid of Mapper, a Sperry fourth-generation language designed to maximize programmer productivity. Jones said that 80% to 90% of the conversion will be in Mapper. The remainder will be in Cobol.

The programmers were given Mapper training in the summer of 1983. The first Mapper programs were written in the fourth quarter of 1983 to give the programmers experience.

Then, this past January, one group was assigned to handle only conversions, while another processed requests for maintenance. "Before [under the Cobol system], we spent too much time on maintenance," Jones said. "We got dragged into the day-to-day activity of putting out fires and did not spend enough time on new development and conversion."

Currently, the programmers are in the early stages of using Mapper and in the process of designing data bases. When the data bases are established, users will apply Mapper to manipulate their own information and conceive and write their own reports, Jones said.

Eventually, the 1100/62 mainframe will serve the entire campus. This connection, using broadband coaxial cable currently on campus, which is available to 80% of the desired locations, will be used to tie in Sperrylink deskstations to the mainframe so anyone can access both internal and external data bases. "Through Sperrylink, we hope to give access to all resources using the same deskstation used for office automation," Jones said.

Presently, there are nine Sperrylink terminals on campus. Their number will be increased to 64 before the end of 1984 and eventually to 285.

Software Engineers

AT ISC, SOFTWARE CREATIVITY IS BOUNDLESS.

That's because ISC Systems Corporation provides an atmosphere where your creativity and innovation is bound only by your abilities. Our team of software professionals have made us a leader in the design and manufacturing of turnkey on-line terminal systems for the financial industry in just seven years with cumulative sales in excess of $250 million. Because of their dedication our growth has been constant. Now ISC needs more creative professionals to share in this growth.

As an ISC Installation Software Engineer, you will be responsible for the development and coding as well as customer interface throughout the installation of our customized financial applications software.

To qualify, you should possess Assembler Language programming experience and the ability to work with a system that incorporates a Z-80 microprocessor with a sophisticated multi-tasking operating system. Your experience in financial applications and data communications programming is also desirable.

ISC will expand your personal growth with a competitive salary and incentive bonuses, and flexibility in the hours you work. Send your resume and salary requirements to the ISC Regional office closet to you.

For information on Northern & Midwestern openings contact:
Kathy Amerman
ISC Systems Corporation
2015 Spring Road
Suite 125
Oakbrook, Illinois 60521

For information on Western openings contact:
Jennifer Tippett
ISC Systems Corporation
1040 Marsh Road
Suite 200
Menlo Park, California 94025

For information on Southern & Southwestern openings contact:
Mike Robertson
ISC Systems Corporation
1100 Circle 75 Parkway
Suite 300
Atlanta, Georgia 30339

ISC

EOE M/F

DEC TO IBM SNA

Now available...full SNA capability for your DEC computer! Comboard/SNA gives your terminals access to IBM interactive applications. Data can be transfered between systems transparently, all in the complete fully supported package, from Software Results.

Comboard/SNA is a proven and reliable, single-board, 256KB communications computer that plugs into your DEC Unibus. Teamed with Comboard software, the system is a cost-effective solution to troublesome SNA communications problems.

Comboard/SNA allows your DEC to emulate an IBM PU Type 2 communications node. You have a full gateway into your SNA without the trouble of passing through a secondary network.

For further information, fill in the coupon below or call Software Results... the leader in DEC to IBM communications.

See us at
INTERFACE '84
Las Vegas, March 12-15
Booth #1720

COMBOARD
Communications Results

NAME
COMPANY
ADDRESS
CITY STATE ZIP
Telephone
CW

SOFTWARE RESULTS CORPORATION
Call Toll-free
1-800-SRC-DATA
(1-800-772-3282)
In Ohio call collect
1-614-267-2203
2887 Silver Drive, Columbus, Ohio 43211
Telex: 467-495 SRC DATA CI

COMBOARD™ Software Results Corporation
DEC UNIBUS™ Digital Equipment Corporation
IBM, SNA ™ International Business Machine Corp

FREEFORM™/IDM™

Dimension's FREEFORM™ Application Development Software for the Britton-Lee Relational IDM™ provides:

- **a common front-end to both PC's and Minis**
- **dramatic programmer productivity increases**
- **controlled PC/Mini Access to the IDM™**

Dimension Software Systems, Inc.
Dallas, TX
Attn: Bryce Dietrich Call (214) 262-8201

IDM is a trademark of Britton-Lee, Inc.
Freeform is a trademark of Dimension/IDM Partnership, Ltd.

NEWS

DG users announce August meet

WESTBORO, Mass. — The 11th annual North American Data General Users Group Conference, for users of Data General Corp. equipment, is scheduled for Aug. 27-30 at the Sheraton Harbor Island East Hotel in San Diego.

It reportedly will feature three days of presentations, roundtables, exhibits and educational seminars.

One of the scheduled featured speakers is Richard Byrne, president of the Byrne Group of Tiburon, Calif., who is to speak on how to master the planning, preparation and performance that are keys to success in the future. A second keynote address will be delivered by Jean Yates, president of Yates Ventures, who will discuss the future of Unix. The scheduled speaker for the conference banquet is Barbara Pletcher, executive director of the National Association for Professional Saleswomen. Pletcher will discuss the actions and attitudes that enhance personal power.

Registration fees are $300 if received before July 21 and $325 if received after this date. Group members are eligible for a $25 registration fee discount.

Information is available from the North American Data General Users Group, c/o Data General, 4400 Computer Drive, Westboro, Mass. 01580.

Reactive or resourceful?

Action rather than reaction marks the resourceful and successful manager. As an MIS/DP specialist, you can anticipate the needs of your colleagues and act in your company's best interests by introducing Dow Jones News/Retrieval® into your corporation.

Dow Jones News/Retrieval can be accessed with most standard time-sharing terminals, personal computers or word processors with communications capability. . .or even integrated into your office automation systems.

It's one way to be certain any manager and staff member, in any department, can have the reliable business and financial news, corporate analyses and economic forecasts needed to anticipate and respond quickly to opportunities for growth and profits.

Dow Jones News/Retrieval is a powerful, versatile, time-saving and, above all, extremely easy-to-use information resource that has application at every level of corporate activity. It will give your entire management team an immediately accessible selection of high-quality data bases they can use to solve problems, analyze trends and increase productivity.

Only Dow Jones News/Retrieval provides instant electronic access to *The Wall Street Journal, Barron's,* the Dow Jones News Service *and* Dow Jones Current and Historical Quotes that are continuously monitored for accuracy by our staff.

Dow Jones News/Retrieval can even accommodate departmental usage billing if you wish.

Users may also purchase Spreadsheet Link, the Dow Jones Software package that allows you to download data from Dow Jones News/Retrieval into three of the leading spreadsheets: Visicalc®, Lotus™ 1-2-3™ and Multiplan®.

For every action there's a reaction. Call Dow Jones News/Retrieval right now and watch your colleagues applaud a very smart decision.

For full details, call Eric Bradshaw, National Sales Manager, during office hours at (609) 452-2000, Ext. 2678.

DOW JONES
NEWS/RETRIEVAL®

Copyright © 1984 Dow Jones and Company, Inc. All Rights Reserved. Dow Jones News/Retrieval® is a registered trademark of Dow Jones and Company, Inc.

CALL ERIC BRADSHAW AT 609-452-2000, EXT. 2678

Cadre meeting set for Toronto

TORONTO — In conjunction with Applied Data Research, Inc.'s (ADR) 25th anniversary, the annual meeting of ADR's independent users group, Cadre, will be held at the Sheraton Centre here Sept. 19-23.

According to a spokesman for Cadre, the conference is intended as a forum for discussion among ADR users and the firm's product development staff.

Presentations will cover all of ADR's product line, including the Librarian source library management system, the Empire decision support system, the Roscoe remote job entry system and the Ideal application development system.

More than 125 sessions are scheduled for both end users and data processing personnel.

A demonstration room will be available for product demonstrations, the spokesman said.

The registration fee for the Cadre users group meeting is $335. Information is available from Cadre Director, Applied Data Research, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

IBM users workshop eyes micro security

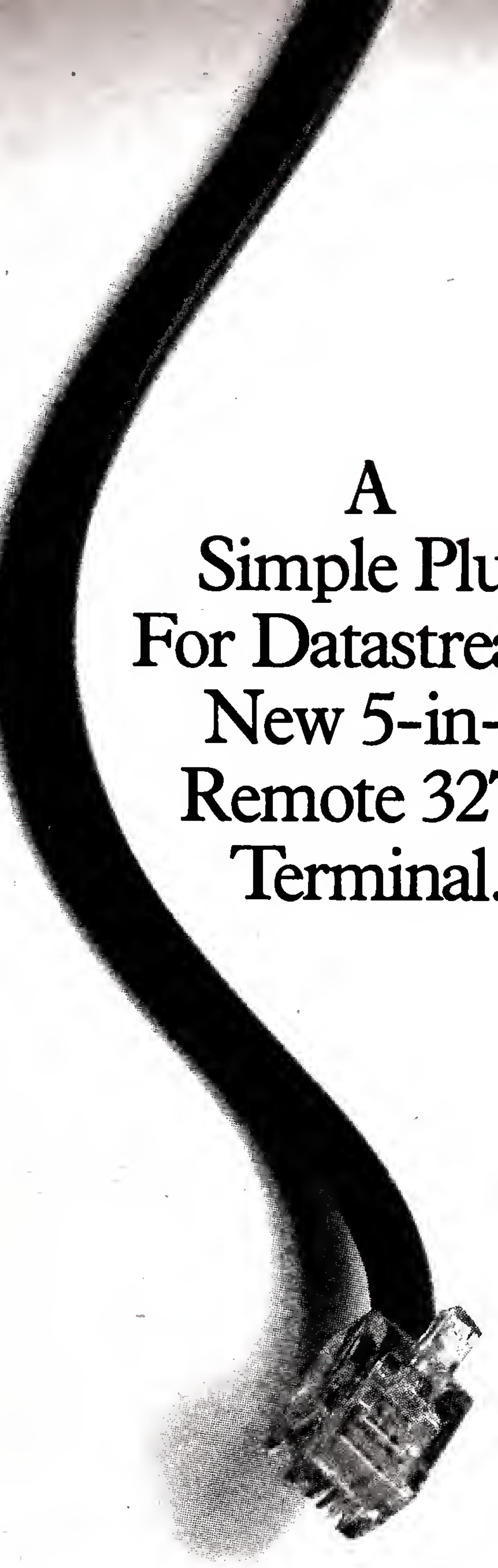
ARLINGTON, Va. — Micro Security '84 is the theme of the upcoming Third Annual IBM Users Computer Security Workshop, slated to take place here July 16-17.

Ten workshops devoted to security issues raised by the proliferation of microcomputers highlight this event, which will be keynoted by Harry DeMaio, IBM's director of data security programs.

Some of the sessions included in the program are: "PC Security Awareness — From Executive Orientation to Technical Training" and "A Unified Approach to Securing Micros, Word Processors and Workstations."

Early registration is $455, with group discounts available. Further details may be obtained from conference sponsors at the Computer Security Institute, 43 Boston Post Road, Northborough, Mass. 01532.

All the features
of IBM's new 3180
plus remote access.



A Simple Plug For Datastream's New 5-in-1 Remote 3278 Terminal.

The 878-15 features a standard 3278 keyboard plus 24 PF keys and an integral 10-key numeric pad. The 14" screen is available in green or amber phosphors.

Anyway you look at it, the Datastream 878-15 is an extraordinary 3278 display station.

Look first at versatility. The 878-15 supports five screen sizes. IBM® 3278 Models 2 through 5. Plus DEC® VT100. So you can access any 3270 or minicomputer application from a single display station.

And all five screen sizes can be selected by the host. Or menu-selected by the operator.

Then take a look at the 878-15's sophisticated keyboard. It delivers complete 3278 functionality. And advanced 3290 features like 24 top row PF keys, an operator-definable 10-key pad and more. The 878-15 even offers a port for direct printer attachment.

And that brings us to the simple plug.

The 878-15 is designed for use with Datastream's BSC or SNA Remote Cluster Controllers, which allow the 878-15 to access its host or hosts over ordinary phone lines. All you have to do is plug it into a modem and dial in. Or connect it directly to the controller. Either way, you'll never see the expense of leased lines again.

Together, 878-15 and 178-2 Display Stations and our Remote Cluster Controllers make quite a team.

Offering advantages like sophisticated security. Remote diagnostics. Multiple concurrent sessions. Dual IBM host access. Minicomputer access. And communication with other peripheral devices.

If you're looking for flexible, reliable and inexpensive ways to extend your 3270 network, Datastream Display Stations and Remote Cluster Controllers are well worth looking into.

Call or write today. Datastream, 2520 Mission College Blvd., Santa Clara, CA 95050. (408) 986-8022. Outside CA, CALL TOLL FREE: 800-952-2500.

®IBM is a registered trademark of International Business Machines. ®DEC is a registered trademark of Digital Equipment Corporation. ©1984 Datastream.

DATASTREAM

Northwestern Bell calls on supermicros to trace cables

OMAHA, Neb. — Construction and repair crews for Northwestern Bell Telephone Co. soon will have help from local in-house computer systems as they work on the network of underground cables carrying phone messages across the company's five-state service area.

Northwestern Bell, a regional arm of U.S. West, one of the seven newly created regional holding companies, is employing a system of Unix-based supermicrocomputers from Plexus Computers, Inc. of Santa Clara, Calif., to revise its system for locating underground telecommunications cables. By the end of the year, the company will place the systems in 24 engineering offices, as interactive nodes on its network of Unix-based AT&T 3B supermicrocomputers servicing North and South Dakota, Iowa, Minnesota and Nebraska.

Augments older system

The supermicros will augment an older system of stand-alone microcomputers that did not fully meet the computing needs for some 300 users in the telecommunications company's engineering centers, according to Northwestern Bell. While the stand-alone systems will be used elsewhere, the supermicros will help streamline the process of locating underground cables for field crews that do not have ready access to company maps and charts.

The whole process, now handled at a centralized location, will be computerized and distributed, with the engineering center installations providing quicker service to specific regions, Northwestern Bell said.

The smaller AT&T computer systems, the 3B2 and 3B5, also were considered for installation, according to Jim Atkinson, data systems manager at Northwestern Bell. However, the AT&T products were not available for delivery and could not match the price/performance characteristics of the Plexus systems, Atkinson said.

"What we tried to address was a user community in the eight to 10 range," he said. "We found we could put in the Plexus for $40,000 a system, give more power and more flexibility than going out with stand-alone micros and get all the value-added aspects with the office automation."

"Initially, we put in a small micro, but the engineers outgrew it very rapidly," Atkinson recalled. "We selected the Plexus system because of the advantages of using a shared-resource system for multiple users, and now we are finding we can add value with the electronic mail and other office software."

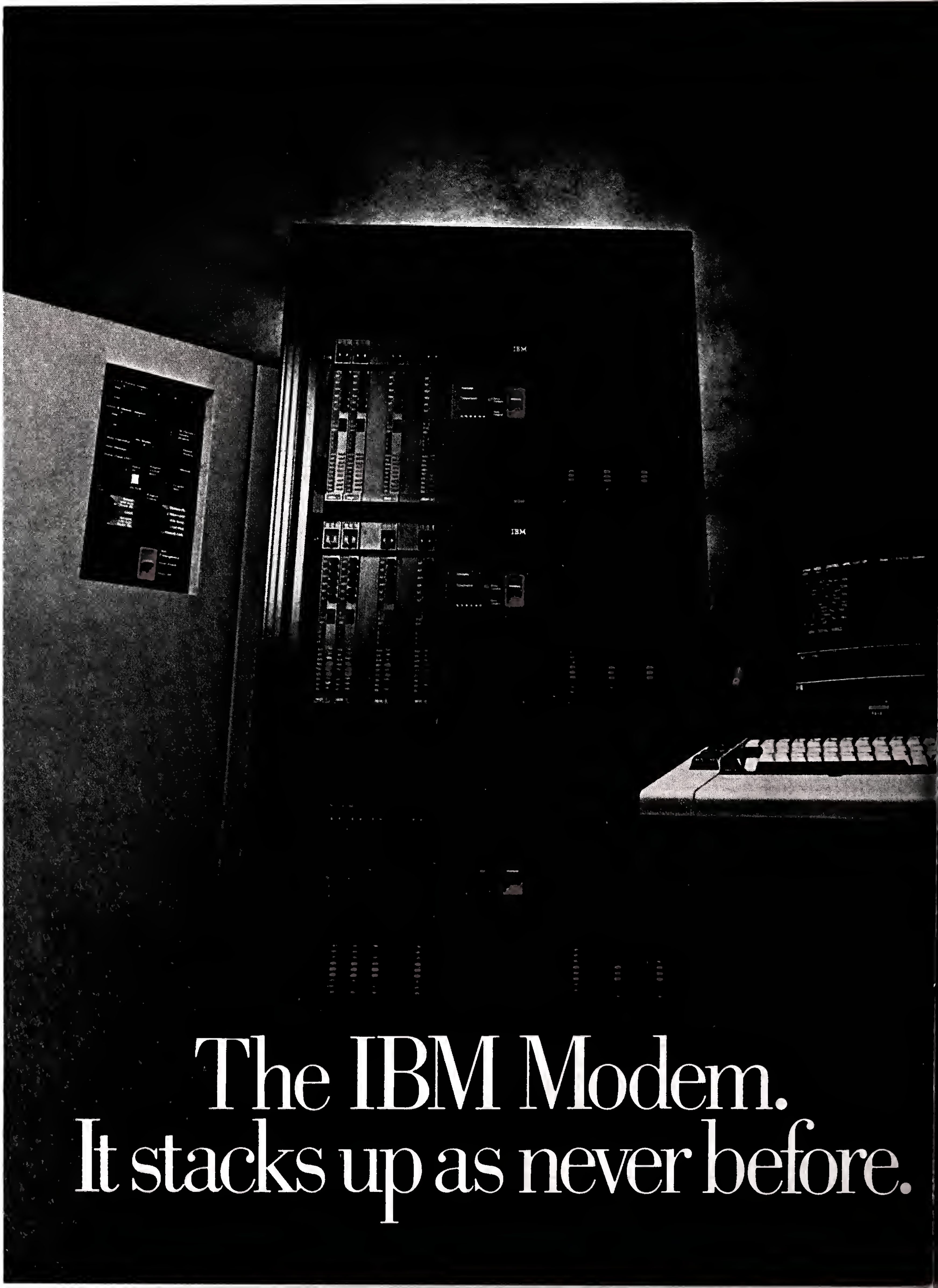
Designed with a proprietary multiprocessor architecture based on the Motorola, Inc. 68000 microprocessor, the 32-bit systems will be outfitted with 72M bytes of hard disk storage, providing sufficient memory to create a data base of cable map identifiers and addresses that will also double as backup for the office automation functions.

Using Unify, relational data base management software from the Unify Corp. in Portland, Ore., the data base system will be designed with a matrix of street addresses, Atkinson said.

Through a process of elimination, users can call up the individual maps to find exact locations.

Various options for providing visual map display through direct interfacing to the Plexus systems, including the use of microfilm readers and digitized mapping systems, are being explored, according to Northwestern Bell.

Northwestern Bell also is considering digitized mapping as an addition to the cable locator system, and computer-aided design and manufacturing-type maps to help maintain and update the system, Atkinson said.



Package manages motor vehicles department's net

TALLAHASSEE, Fla. — The Sunshine State knew back in 1979 that it needed a management system to track records.

The network of terminals and related computer and communications components that have since been acquired for Florida's Department of Highway Safety and Motor Vehicles consists of 2,500 separate pieces of equipment in 294 locations. But long before the network reached these proportions, the staff at the department's data center here realized that some form of on-line resource management should be installed.

The first hardware components were acquired in 1979 under an installment purchase plan. Installment purchases have been made at intervals during the past four years, and now computerization of the bureaus and their functions is nearly complete. However, as the state grows and the activities of the Department of Highway Safety and Motor Vehicles expand, equipment will be acquired indefinitely.

The network configuration was agreed upon early, said Randy Walford, the department's system design development and research manager. It is presently comprised of two subnetworks, a web of Honeywell, Inc. 2020 processors serving the driver's license bureaus and a chain of IBM Series/1s that serves the tax collectors offices, where title work is performed. Both of these networks communicate with mainframes at the data center.

Just after hardware installation began, Walford started looking for a network management system. His foremost concern was finding one that would track the maze of payment schedules, verify invoices for hardware and software purchases and handle maintenance contracts.

He also wanted to monitor his inventory. Walford wanted to find out what kind of equipment was out there, where it was installed and the status of new equipment from order through delivery and installation. Another requirement was the ability to track the efficiency of the installed components.

Pleasant surprise

When Walford began his analysis, he was unaware that such packaged systems existed. He said he was pleasantly surprised when several vendors called on him with potential solutions. He selected three products for evaluation and sought out users. Netman, from California Software, Inc., offered the combination of financial management plus inventory and the problem tracking that he wanted.

Netman was installed in November 1982. Debbie Hoover, the department's DP control specialist, whose background was limited to keypunch experience with no other formal DP training, was given the job of building and maintaining Netman's data base. Hoover learned to use Netman while taking on the formidable task of keying in the hardware and software components in the network, as well as keeping up-to-date with new components and tracking their status through installation.

Initially the task seemed overwhelming, but Hoover was helped by Netman's built-in menus, prompts, help commands and fill-in-the-blank screens. For example, when she came to 200 identical terminals all leased under the same contract agreement, she made the entry just once and instructed Netman to copy it 199 more times. Within minutes, a major portion of the data base was installed, she explained.

Hoover started tackling the problem of tracking all of the department's equipment. Starting at the data center, she entered components by location, serial number and logical name. She then en-

See **NET** page 62

The rack-mounted IBM 3868 Modem saves you space. And money. And effort.

Space, because IBM's one-inch-wide vertical package allows you to mount up to 12 modems in one enclosure that fits a standard 19-inch rack.

Money, because each enclosure needs only one power supply and cooling system to support all of its modems.

And you manage your network with less effort because the IBM 3868 Modem has the same high availability and rock-steady reliability as other modems in the 386X Series—plus an enhanced Link Problem Determination Aid (LPDA).

Working with software available for many IBM host systems, the LPDA performs greater end-to-end management. Now line conditions are identified further downstream from the host, and in more detail. For example, conditions in any multipoint circuit can be pinpointed to a particular leg, including tailed configurations off multiplexed links.

In fact, to help you keep your network humming, the LPDA and host software monitor and provide you with a line quality value, a receive signal level, an error-to-traffic ratio and modem self-test results to help you isolate line problems. Now you can communicate them more precisely to your communications carrier.

And because 3868 Modems are so reliable, they're backed by a full three-year warranty.

Try them for up to four weeks: just select 2400, 4800 or 9600 bps line speeds. If you purchase in quantity, discounts are available.

Ask your IBM representative for more information. For a free brochure, or to have an IBM representative contact you, call toll free 1 800 IBM-2468, Ext. 90, or return the coupon.

IBM®

6-11

IBM
DRM, Dept. BO/90
400 Parson's Pond Drive
Franklin Lakes, NJ 07417

☐ Please have an IBM representative call me.
☐ Please send me more information on the IBM Modem.

Name__________
Title__________
Company__________
Address__________
City______State______Zip______
Phone__________

NET from page 61

tered the financial and contract information. When the data center was complete, she moved from bureau to bureau systematically.

Now the data base is current, requiring only the entry of the communications lines. This addition, Hoover maintained, is critical, since the lines tie the network together. "When these are entered and trouble is reported on a line, Netman can immediately generate a report showing all the components that will be affected," according to Hoover.

Problem tracking was not a primary concern at the outset, but now a staff of 10 handles this function. Called the Communications Group, these people receive trouble calls by telephone. They key in the problems, relay their solutions to the problem areas and keep track of their status through resolution. Reports on problem areas are also supplied on request. They can be highly informative, showing areas where problems cluster due to component, operator, maintenance or vendor difficulties.

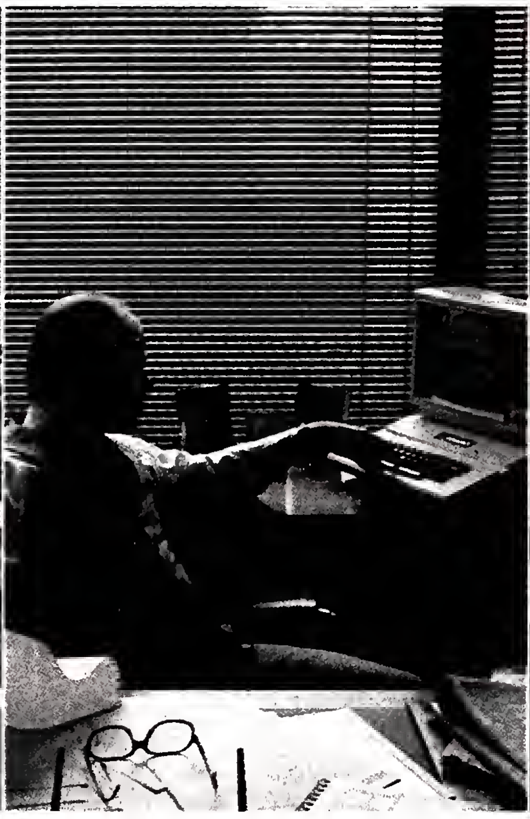
Access to Netman is controlled by its internal security feature. The Communications Group is limited to Netman's problem management screens. Hoover and her assistant, Angela Starbuck, have access to the financial screens. On a monthly basis, they generate reports to verify invoices, and additional reports are generated on request.

"Reports can be very revealing," Hoover said. "They can tell how much money the data center has spent on a selected account to date and how much is due over the balance of the contract. They can tell when contracts are about to expire and what contracts need renewal. They can give an expense breakdown showing what is owed per month on certain categories of equipment. Netman can even compare project expenses against the budget and show how much money is available for purchase of new equipment."

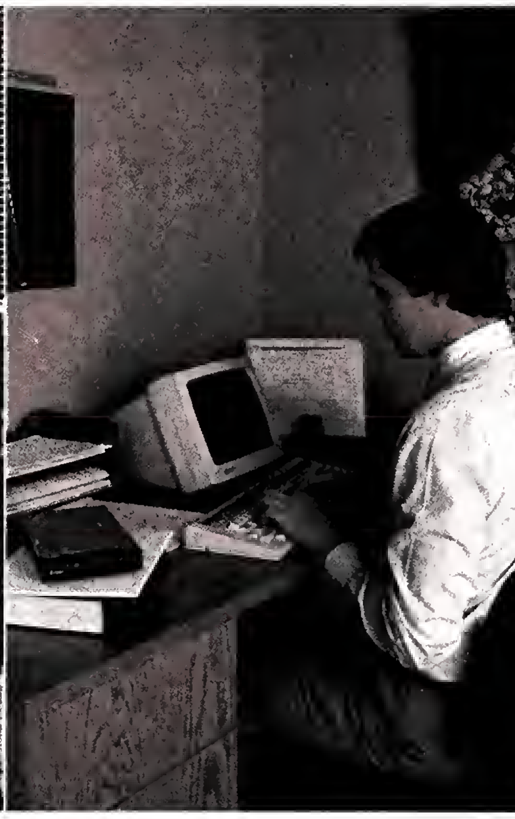
As for Netman's future with the department, Walford said a reporting schedule will become more formalized, but generally "we're just going to let [Netman] do its job."

To all reps: Price changes on following items effective immediately: No. 10-11A, 10-114A, 10-AL.

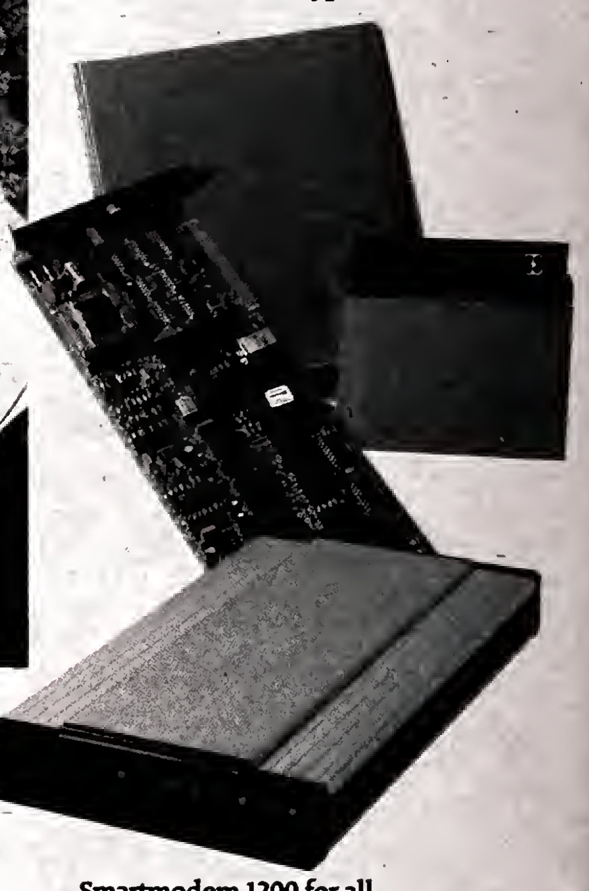
Chris: The latest offer looks better, although it's still not what we were hoping for. Try for another compromise.



Just got the word from Gary. Increased our share by 6%. If trend holds, we'll pass competition by third quarter!



Smartcom II communications software, currently available for IBM PC, DEC Rainbow 100, Xerox 820-II and Kaypro II.



Smartmodem 1200 for all computers with an RS-232C interface; Smartmodem 1200B plug-in board for the IBM PC.

Microcomputer communications? Get control of the situation with

Hayes™

Microcomputer communications can present the DP/MIS staff with a tangle of mis-matched hardware, user-hostile software, and a situation that can quickly get out of hand.

Hayes can help you avert that chaos, with a telecomputing system designed expressly for microcomputers.

A system so advanced, it's downright simple. Economical. And requires no handholding from you.

Hayes. The computer's telephone. Our Smartmodem 300™ and Smartmodem 1200™ connect to any desktop computer with an RS-232C port. They operate with rotary dial, Touch-Tone® and key-set telephone systems. At full or half duplex. And both feature self-test capabilities, as well as indicator lights and built-in speakers for monitoring calls.

The lower-priced Smartmodem 300 is ideal for local data swaps and communicates at 300 bps. A built-in speed selector on Smartmodem 1200 automatically detects transmission speeds (110, 300 or 1200 bps).

Smartmodem 1200B™ is also available as a plug-in board for IBM® Personal Computers. And Hayes manufactures the Micromodem IIe® for Apple® II, III, IIe and Apple Plus computers, as well. It comes packaged with Smartcom I™ communications software.

Speaking of software, more programs are written for Hayes modems than for any other. And that impressive list includes our own incomparable communications software.

Smartcom II™ Complete, menu-driven software for the IBM PC, DEC Rainbow 100,™ Xerox 820-II™ and Kaypro II.™ Even first-time communicators will find success with Smartcom II. Screen prompts guide users in the simple steps it takes to create, send, receive, list, edit, name and re-name files.

Tasks like simultaneously receiving, printing and storing data–completely unattended–are easily managed with Smartcom II, because it takes full advantage of Smartmodem's capabilities.

The program reduces lengthy dial-up and log-on sequences to a single keystroke. It stores communications parameters for 25 remote systems.

Plus, there's an on-line help feature that explains prompts, messages and parameters.

Our reputation speaks for itself. Hayes has five years of solid leadership in the microcomputer industry. Nationwide availability through retail computer stores. Trouble-free factory service and call-in assistance. A limited two-year warranty on all hardware. And the most efficient telecomputing system available. Anywhere.

If you're involved in linking micros or setting standards for configurations, remember this. Everything your people need to know about communications can be summed up in one word: Hayes.

Hayes®

Hayes Microcomputer Products, Inc., 5923 Peachtree Industrial Blvd., Norcross, GA 30092. 404/441-1617.

Micromodem IIe is a registered trademark of Hayes Microcomputer Products, Inc.
Smartmodem 300, Smartmodem 1200, Smartmodem 1200B, Smartcom I and Smartcom II are trademarks of Hayes Microcomputer Products, Inc.
Touch-Tone is a registered service mark of American Telephone and Telegraph.
IBM is a registered trademark of International Business Machines Corp.
Apple is a registered trademark of Apple Computer, Inc.
DEC Rainbow 100 is a trademark of Digital Equipment Corporation.
Xerox 820-II is a trademark of Xerox Corporation.
Kaypro II is a trademark of Non-Linear Systems.
Z8 is a trademark of Zilog, Inc.
©1983 Hayes Microcomputer Products, Inc.

Smartmodem Specifications:
Low Speed Data Format: (Smartmodem 1200 and Smartmodem 300) Serial, binary, asynchronous; 7 or 8 data bits; 1 or 2 stop bits; odd, even or no parity (0-300 bps).
High Speed Data Format: (Smartmodem 1200) Serial, binary, asynchronous; 7 data bits; 1 or 2 stop bits; odd, even, or fixed parity or 8 data bits; 1 or 2 stop bits; no parity (1200 bps).
Dialing Capability: Touch-Tone® and rotary-dial pulse dialing.
Command Buffer: 40 characters.
Commands: (unnecessary with Smartcom II software) A: Immediate answer. A/: Repeat last command. C: Transmitter Carrier. D: Dial command, including simple dialing, waiting for second dial tone, auto-dialing and other features. E: Local echo. F: Full/half duplex. H: Switch hook. M: Audio monitor. O: On-Line. P: Pulse dialing. Q: Quiet mode. R: Reverse originate/answer mode. S: 17 "Set" commands speed, escape code character, number of rings to answer on, etc. S?: Checks operational parameters above. T: Touch-Tone dialing. V: Verbal result codes.
Result Codes: (can be numerical/verbal): 0/OK: Command line ok. 1/Connect: Carrier detected. 2/Ring: Phone is ringing. 3/No Carrier: Carrier lost or never heard. 4/Error: Error in command line. 5/Connect 1200: Carrier detected at 1200 bps. (Smartmodem 1200 only.)
Audio Monitor: Two-inch speaker with volume control.
Rear Panel: On-off switch, power jack, RS-232C connector, modular phone jack connector, volume control.
Operation: Full or half duplex.
Data Rate: 0-300 bps and 1200 bps for Smartmodem 1200; 0-300 bps for Smartmodem 300.
Interface: RS-232C.
Intelligence: Z8™ microprocessor with 4K byte control program for Smartmodem 1200; Z8 microprocessor with 2K byte control program for Smartmodem 300.
Modem Capability: Bell System 103 or 212A compatible originate or answer mode for Smartmodem 1200; Bell System 103 compatible originate or answer mode for Smartmodem 300.
Receive Sensitivity: –50dBm for Smartmodem 1200; –45dBm for Smartmodem 300.
Transmit Level: –10dBm.
Registration: FCC registered for direct-connect to the nationwide phone system. Connects with modular jacks RJ11W, RJ11C, RJ12W, RJ12C, RJ13W, RJ13C.
Power Pack: U.L. listed 120VAC, 60Hz, 13.5VAC output.
Size: 1.5" × 5.5" × 9.6"

Furniture store waxes sales with installation of mini

ADDISON, Texas — The Super Office Store here was doing a nice business about three years ago, but it wasn't growing like its owner wanted it to.

Joe Newton, owner of the office furniture and supply company located in the Dallas-Fort Worth Metroplex, decided he needed a way to help his business grow in the face of stiff competition in the area. Specifically, Newton wanted to find some way of convincing his largest customers to purchase all their office supplies from his store.

The business also faced some internal problems. Although the store used a timesharing computer firm to handle its billing and payroll, orders were processed by hand. Moreover, sales volume had reached a level that made manual order processing and inventory control uneconomical. Handling partial shipments and back orders had become a nightmare, Newton said.

Newton determined that the only practical solution to his problems was to computerize the store. But finding a system that fit his needs proved difficult.

"We looked at just about every type of computer system that fit our budget, from IBM to you-name-it," Newton recalled. "We could get some good hardware, but the computer companies couldn't provide a turnkey system that would do what we wanted."

What was needed, he said, was a multiuser, multitasking system that could accommodate six or seven workstations and keep track of some 15,000 different inventory items and customers. Another requirement was fast disk access, so order-entry clerks could read and write records to disk without waiting for the system to finish a prior task.

Convinced that he could not find a turnkey to meet his store's needs, Newton decided to commission a software house to write custom application programs to run on the hardware of his choice. After discussions with software vendors, he decided on Computer Automation, Inc.'s LSI-4 minicomputer.

After two false starts in which software houses commissioned to write a program failed to complete it, Newton contacted an independent consultant and programmer in Chicago. The consultant "had a data base management operating system and a business applications package that he thought could be modified to meet my needs and run on a Computer Automation LSI-4 minicomputer," Newton said.

The software package included modules for customer lists, vendor lists, accounts receivable, accounts payable, a chart of accounts, general ledger, journals, perpetual inventory and an order-entry system that tied them all together. Also included was a payroll program.

The store's computer now operates as a data base management system, which means that every piece of data in memory is immediately available to every user authorized to access it. So an order-entry clerk checking on an item for a customer always has up-to-the-minute price and inventory information.

The original system, installed in February 1981, consisted of a Computer Automation Naked Mini 4/30 minicomputer with a 96M-byte disk drive, seven order-entry CRT terminals and a printer. Soon after installation, the system reached its limit of 12 peripherals. A second 4/30 minicomputer was soon added, permitting the system to handle up to a total of 24 terminals and printers.

The second computer and its 12 peripherals reportedly act as a separate stand-alone system in all aspects except disk access. Because the system is operated as a data base manager — with the at

See **MINI** page 64

SCIENCE/SCOPE

In designing and making a satellite part entirely via computer, Hughes Aircraft Company developed what may be a first in computer-aided design/computer-aided manufacturing. The part is a launch lock pivot plate for the Intelsat VI communications satellite. (The plate keeps the inner and outer sections of the spacecraft together until it is time to begin the spun/despun operation in space. This operation stabilizes the satellite in orbit.) The plate was designed on a CADAM system and made on a computerized milling machine driven by a ComputerVision system. Because CADAM lacks the ability to run milling machines without extensive manual manipulation, engineers developed a custom translator. This new programming allowed CADAM data to be understood by ComputerVision and, in turn, by the milling machine. The use of CADAM and ComputerVision in tandem is believed to be an industry first.

Geologists teamed with the U.S. Navy over Mt. St. Helens in 1980 to use the latest defense technology for a unique view of the simmering volcano. Their eye was the nation's first fully integrated night attack system, built by Hughes for the A-6E Intruder aircraft. The system, called the Detecting and Ranging Set (DRS), includes a thermal imaging sensor that sees through darkness, smoke, or haze. Infrared images recently released by the Navy showed significant hot spots two weeks before the May 18 eruption. The imagery prompted civil authorities to step up their warnings and evacuation efforts. The DRS let geologists view the entire mountain or zoom in to examine areas of interest. Videotapes were made on flights for later evaluation. Geologists said the DRS gave them a broader, more precise thermal picture of the volcano than was otherwise possible.

Night will turn into day for helicopter pilots flying low and fast over rough terrain while using a new infrared system. The Helicopter Night Vision System (HNVS) is designed to make it easier for a pilot to fly low-level missions at night, in adverse weather, or in hazy and smoky conditions. The system uses a forward-looking infrared (FLIR) sensor, mounted in a turret under the nose of the helicopter, to project TV-like pictures of the outside world on the pilot's helmet visor. When the pilot glances in any direction, a helmet servo linkage causes the turret to aim automatically along his line of sight. The pilot can have flight symbology superimposed on the helmet, further reducing his need to look down at cockpit displays as he flies. HNVS is produced by Hughes.

Defects in printed circuit boards are spotted quickly and accurately with a color graphic display in one Hughes manufacturing division. Digital information from the computer-aided design of boards is processed before testing begins to create exact images of board topography. Automatic equipment identifies circuit faults and notifies a central computer. If the computer detects a failure trend, it will include an advisory in the test report so defective processes may be investigated. The test data file is then sent to a computer-graphics work station. There the board image is displayed, with each fault area shown in contrasting color. Hit-or-miss troubleshooting is thus eliminated.

Career growth opportunities exist at Hughes Support Systems for a variety of engineers qualified by degree or extensive work experience. They include systems engineers, radar engineers, and software and hardware design engineers for major simulation and test equipment programs. Also, field engineering posts throughout the U.S. offer travel, autonomy, and responsibility for the life cycle of Hughes electronics systems. Please send your resume to Lowell Anderson, Professional Employment, Dept. S3, Hughes Aircraft Company, P.O. Box 9399, Long Beach, CA 90801-0463. Equal opportunity employer. U.S. citizenship required.

For more information write to: P.O. Box 11205, Marina del Rey, CA 90295

HUGHES
AIRCRAFT COMPANY

Electronic theater, arts show to mark Siggraph '84

MINNEAPOLIS — A total of 27 courses, panel discussions, paper presentations and two special events — an electronic evening theater and a design arts show — will be featured at Siggraph '84, the 11th Annual Conference on Computer Graphics and Interactive Techniques, which will be held from July 23-27 here by the Association for Computing Machinery's Special Interest Group on Computer Graphics.

Commercial, scientific and artistic applications of computer graphics will be on display at an electronic evening theater from July 23-27 at the Minneapolis Auditorium and Convention Hall Arena. Architectural, industrial and visual communications projects that make significant use of the computer will be featured at the conference design arts show, which runs from July 22-29 at the Minneapolis College of Art and Design.

The design arts show features works by talents in computer graphics, design and visual image fields. The show's curators are Del Coates, professor, Sante Fe University and an industrial design consultant; Muriel Cooper, director of the Visible Language Workshop at MIT; and William Mitchell, head of the University of California, Los Angeles Graduate School of Architecture and Urban Planning.

The electronic theater, film and video show includes selected computer graphics works from around the world. Four hours of films, videotapes and multimedia performances will be selected by the following jury members: Loren Carpenter, Lucasfilm Ltd.; Louise Etra, General Electronics Systems, Inc.; and Kenneth Knowlton, Via Video, Inc.

Chairing and lecturing at the Siggraph '84 sessions, to be held at the Holiday Inn Downtown, will be representatives from New York Institute of Technology, Bell Laboratories, Lucasfilm Ltd., Lawrence Livermore National Laboratory, Jet Propulsion Laboratory, Evans & Sutherland Computer Corp. and Digital Effects, Inc.

In developing the 1984 course offerings, Course Chair Michael Bailey of Purdue University responded to evaluations completed by last year's course attendees. "The recurring theme throughout the evaluations was the need for more advanced topics," Bailey said. In response to the evaluations, "Advanced Image Synthesis," "Advanced Computer Graphics Animation" and an expanded, two-day course covering "Interdisciplinary Issues in Computer Art and Design" have been included in the Siggraph '84 course offerings.

The evaluations also showed a demand for courses covering new areas of computer graphics. Eight courses added in response are: "Medical and Biological Applications of Computer Graphics," "Entrepreneurship — Starting and Growing a Computer Graphics Business," "Technologies of Highly Interactive Computer Graphics," "Bitmap Graphics," "The Mathematics of Computer Graphics," "Advanced Topics in Curves and Surfaces," "Advanced Computer Graphics Animation" and "Freeform Curves and Surfaces II."

The registration fee for technical programs (panels and paper presentations) is $335 for Association for Computing Machinery members and $365 for nonmembers. The fee for a two-day course is $410; for a one-day course, the fee is $280.

Complete sessions details on Siggraph '84 are available in the advance program from Siggraph '84 Conference Office, 111 E. Wacker Drive, Chicago, Ill. 60601.

MINI from page 63

tendant need for record locking to prevent access to data by one user while another is in the process of altering it — the second 4/30 accesses the disk memory through the first 4/30.

About the same time as the second 4/30 was installed, a plan had been formulated to place remote terminals in the purchasing offices of the store's largest customers. Putting terminals in these offices would reduce the work load on the store's order-entry clerks by letting the selected customers enter their own orders, Newton said.

More importantly, he said, the remote order-entry terminals would bind their users to the store by providing on-line access to a variety of inventory and management reports relating to their orders.

As Newton put it, "By giving our customers reports that enable them to improve their operations, we lock them so tightly to us that they simply can't afford to deal with any of our competitors."

In the three years that have passed since the system was put on-line, a third 4/30 minicomputer has been added to the system and the original 96M-byte disk drive replaced with two 80M-byte drives, according to Newton.

And, Newton said, the system has enabled his store to accommodate a 300% growth in sales volume with fewer people handling order entry and accounting.

Get a grip on you
with a helping

Until now, complete 4300 systems meant buying from just one supplier. Or piecing them together yourself. Some choice.

We decided that things had gotten out of hand.

So we did something about it.

Now you can buy a full line of Memorex 4300 peripherals that are plug-compatible with IBM's best.

At prices that are more than a fair shake.

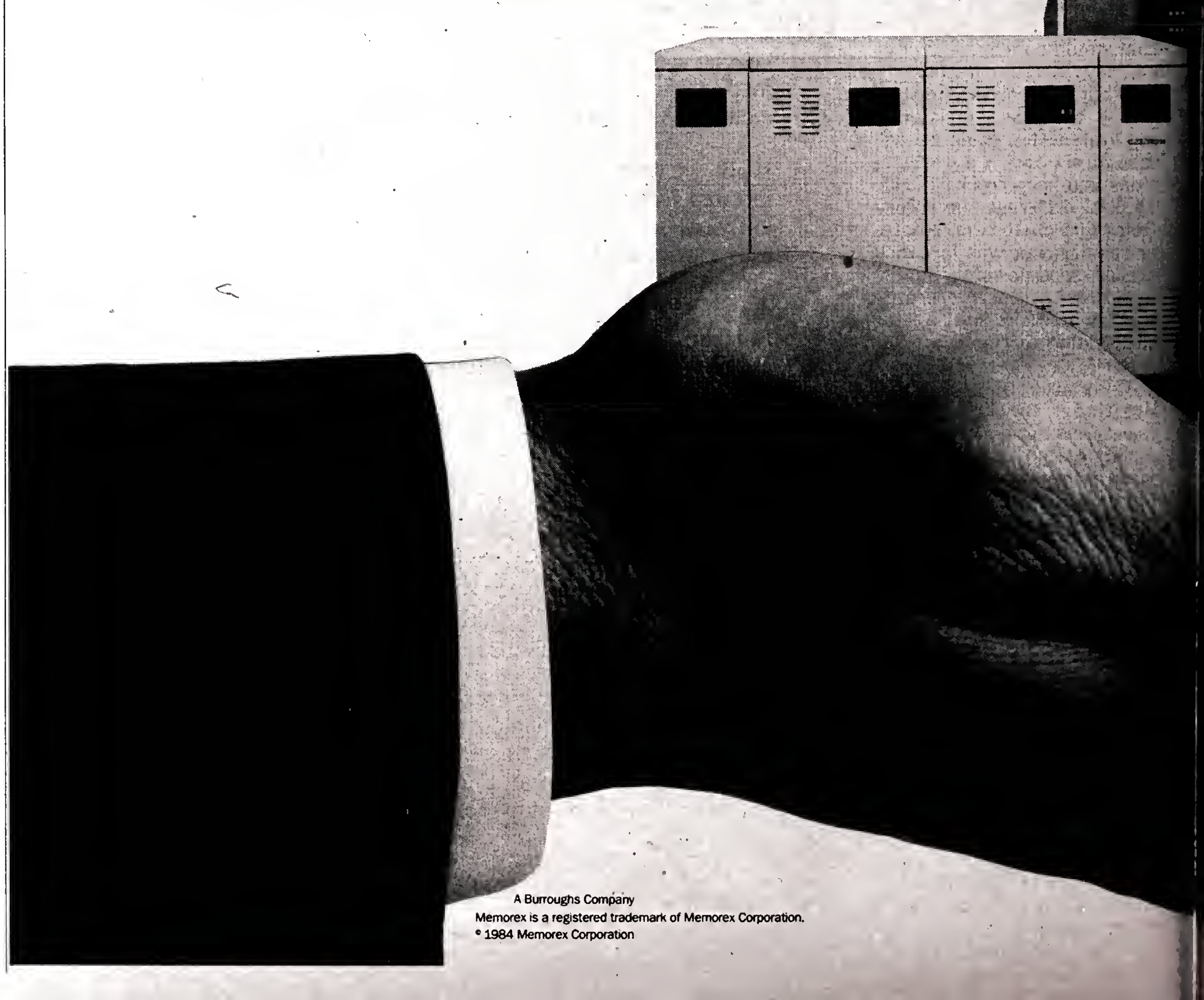
How did we do all this? We listened.

You told us what you wanted. The works. Large-capacity DASD, high-performance tape drives, durable printers, flexible communications subsystems, quality media.

And how you wanted it. In one package. From one source. So you won't have to juggle a lot of details.

We did it, and more.

By assembling very competitive packages on multiple subsystems.



A Burroughs Company
Memorex is a registered trademark of Memorex Corporation.
© 1984 Memorex Corporation

Bank's service capabilities profit from integrated net

HOUSTON — Seeking to strengthen member and correspondent bank service capabilities, a bank here has established an integrated office automation and communications network.

The network links individual Texas Commerce Bank members and correspondent banks to the Houston headquarters. The system features a personal computing capability integrated with the bank's central data processing/data communications network.

To implement its office automation network, the bank selected the Series 21 distributed processing system from Mohawk Data Sciences Corp. (MDS). "Presently, we're upgrading to Mohawk's Super 21 communications processors, which provide more memory and processing power," said W. Ben Kuenemann, executive vice-president and group manager of data services.

"Super 21 has also allowed us to build more efficiently onto our existing office automation network by adding additional MDS products, which will further increase our office automation functionality while retaining compatibility with existing equipment.

"Since Texas Commerce Bank expects to grow substantially over the next decade, another valuable aspect is the expandability of the network to fit our needs," Kuenemann continued. "Our investment is protected because as member banks grow and spread geographically, we can add terminals, memory, keyboards and disk drives as needed."

Mohawk Data Sciences' terminals at work at Texas Commerce Bank

Texas Commerce Bank actually consists of 65 member banks throughout Texas, with additional offices in Denver, New Orleans, New York and eight foreign countries. Individual banks order the communications processors directly from the bank's Data Services Group.

The MDS terminals are linked directly to the bank's IBM 3081 and 3032 mainframes via dial-up and leased phone lines using a 3270 communications emulator. Intelligent, interactive and batch communications are all available to its member banks via the MDS equipment.

Both bisynchronous and asynchronous protocols are available. Additionally, the network supports Synchronous Data Link Control with the bank's implementation of the Systems Network Architecture.

An automated clearing house communications emulator at the bank provides a compatible interface with the Federal Reserve System.

Several member banks have installed personal computers or other minicomputer systems during the last few years, according to Kuenemann.

"While they answered the need to automate a certain procedure, they could not share information with each other or with our host computers," he said.

Integrated personal computing functionality is now provided to member banks through MDS' Personal Computing 21 software package, which permits Digital Research, Inc.'s CP/M operating system for microcomputers to run under MDS' operating system.

"The problems associated with separate, noncompatible and redundant equipment are now eliminated," Kuenemann said. Member banks can utilize thousands of CP/M packages available on the market, as well as access remote host computers or local shared data bases.

Some of the MDS office automation software utilized by the bank includes a word processing package and Plan 21, the company's electronic financial spreadsheet package. "Software we developed further enhances the system's office automation features.

"Available programs include in stallment loan contracts, credit

See **BANK** page 66

4300 requirements
hand from us.

And by offering the total resources of the Memorex Finance Corporation to help you lease whatever you need. Including CPUs. Need a host? Be our guest. Want to upgrade your system later on? You can do it without the hassle of rewriting your contract.

We call it the Memorex Galaxy Program. It can do it all. Except make the phone call.

That's in your hands.

For additional information, call us today. Because we *know* 4300 systems. (408) 987-2301. Or write us at:

Memorex Corporation
Storage Equipment Marketing, MS 12-17
San Tomas at Central Expressway
Santa Clara, CA 95052

Full-Line Support.
When it matters, make it Memorex.™
MEMOREX

See the Storage Equipment Galaxy Line at NCC, Booth #3218.

Supermini does the tricks for computer graphics firm

NEW YORK — A small computer graphics firm here is using a superminicomputer system to design special effects for clients from motion picture studios to television networks to computer manufacturers.

Digital Effects, Inc., a 15-employee company founded in 1978, designs and produces computer-animated film and video; and advertising, entertainment and scientific applications; in addition to advertising and editorial illustration and business graphics.

In the past, the company used a small minicomputer and leased time on an IBM mainframe at an off-site location in order to conduct its work. But that method began to prove much too slow and costly, so the company decided to look into acquiring its own system. Digital Effects also decided it wanted to consolidate its computer operations on-site.

After conducting a market evaluation, the firm decided about a year ago to purchase Harris Corp.'s Harris 500 superminicomputer. According to Digital Effects, the system's ability to process vector and raster information and to produce high-resolution images quickly was a key reason behind Harris' choice.

The company migrated to a Harris 800 processor last March because of the increased throughput it offered, according to Digital Effects' President Judson Rosebush. The 800 has 3M bytes of memory, compared with 2M bytes with the 500. The system also includes disk and tape drives, terminals and data communications hardware. Also part of the system are plotters, vector terminals, a frame buffer, full-color video displays and a film recorder.

Digital Effects writes all its own software and uses two basic types of programs, one for two-dimensional work and another for three-dimensional jobs.

"One of the attractions of the Harris," Rosebush said, "is that it has a batch mode on it; it has spoolers. We didn't have a machine in-house, until the Harris, that had good batching facilities."

Record and information management is a principal task for which Digital Effects uses the Harris system. "We do runs that may take a hundred rolls of magnetic tape to calculate the files," Rosebush said.

"The management problems that go with those are immense. We're at a point in computer animation where the problem of how to keep the light reflection off a sphere is trivial, compared to the problem of how to keep 100 [magnetic] tapes straight."

A typical job at Digital Effects utilizes an interactive process on the front end, followed by batch processing, the company said. The APL language is used as much as 70% on some jobs. Rosebush said the strength of Harris' APL was a critical decision factor in its selection.

"We run APL for the animators, an interactive tool for designing the action and doing graphics. We follow that with Fortran steps for doing visible surface processing, lighting, measuring and so on," he said.

The company also plans to use the Harris to perform graphics calculations, which are time- and region-intensive, requiring substantial amounts of core storage or virtual storage.

"[The Harris] will allow us to do long runs with an efficient price-performance ratio," Rosebush said. "We've looked at its reliability, redundancy, crash recovery and backups — things we can use in a rolling production environment."

BANK

from page 65

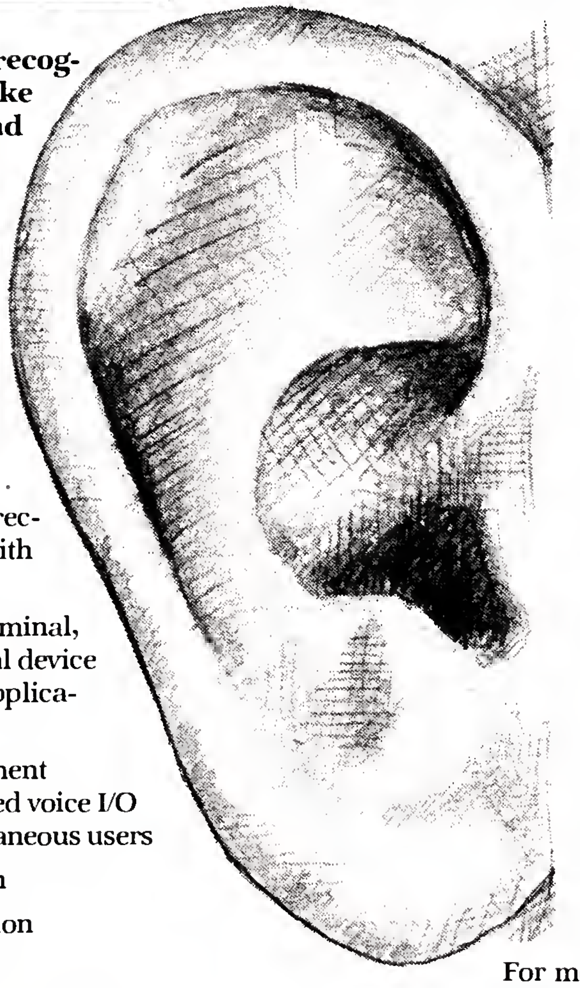
spreads and officer call reports," Kuenemann said. "These three applications were developed using [Mohawk Business Oriented Language], a high-level programming language."

Developing more packages

Through the Series 21 or Super 21, member banks can also access Texas Commerce Bank's Customer Information Files system stored on a mainframe at corporate headquarters. "We are currently developing additional software packages, such as a commercial loan application, a real estate loan reporting application and a safe deposit box billing and accounting system," he added.

The data processing philosophy of Texas Commerce Bank does not support technological expansion for its own sake, but it does support aggressive use of technology as a tool for reducing cost and increasing productivity.

The implementation of the bank's office automation network, provided by MDS, has been a sound investment, according to bank officials, one that equips the bank for continued growth, while enabling it to remain competitive.



CAN WE HAVE YOUR EAR FOR HALF A DAY?

VOTAN, the leader in speech recognition and response, would like to cordially invite you to attend a *FREE* half-day seminar to discover how easy it is to incorporate speech technology into your business operations or product line.

During our half-day seminar, we will acquaint you with emerging trends, applications, and products in the speech industry.

- An economically priced voice recognition/output card for use with the *IBM® PC*
- A standalone RS-232 Voice Terminal, the ultimate data entry/retrieval device for "busy-eyes, busy-hands" applications
- Multi-channel Voice Management System that provides centralized voice I/O capability for multiple, simultaneous users
- Continuous speech recognition
- Speaker independent recognition
- Voice mail and messaging
- Factory floor and office automation voice systems
- Speech applications in aviation and medical industries
- Interactive telephone-based voice systems
- Increasing productivity with voice I/O

Several hundred Fortune 1000 firms have already chosen VOTAN speech products to help them meet the challenges of the 1980's and beyond. They have discovered the simple truth—speech recognition and voice response offer the simplest means of human to machine communication.

1984 SUMMER SEMINARS

SAN JOSE, CA	JUNE 5
MINNEAPOLIS, MN	JUNE 12
DETROIT, MI	JUNE 19
WASHINGTON, D.C.	JUNE 19
CLEVELAND, OH	JUNE 20
ATLANTA, GA	JUNE 20
FT. LAUDERDALE, FL	JUNE 21
DENVER, CO	JULY 17
DALLAS, TX	JULY 18
HOUSTON, TX	JULY 19
HUNTINGTON, NY	JULY 24
MANHATTAN, NY	JULY 25
SAN FRANCISCO, CA	JULY 25
LOS ANGELES, CA	JULY 26
BOSTON, MA	JULY 26

For more seminar information, please return the coupon/reply card, or phone our seminar registrant for further details (415) 490-7600.

® IBM is a Registered trademark of International Business Machines Corporation

Votan
4487 Technology Drive
Fremont, CA 94538-6343
(415) 490-7600

The full spectrum in digital speech.

☐ Please enroll me in your FREE half-day seminar on speech recognition and voice response at:

(City)

☐ I am unable to attend your seminar. Please have a VOTAN salesperson contact me about your products.

☐ 8:30 AM to 11:30 AM session ☐ 2:00 PM to 5:00 PM session

NAME ____ TITLE ____
COMPANY ____ PHONE ____
ADDRESS ____
CITY/STATE ____ ZIP ____

"I can't wait to get my hands on it."

—Richard Bradley
National Training Systems

Richard Bradley's reaction to a sneak preview of our Framework™ personal productivity software for thinkers was a surprise.

We thought Richard and other independent experts who tried Framework would comment on the speed with which it can be learned and used.

So they did. As Richard said, "Framework has an excellent chance of becoming the basic productivity tool knowledge workers have wanted and been waiting for."

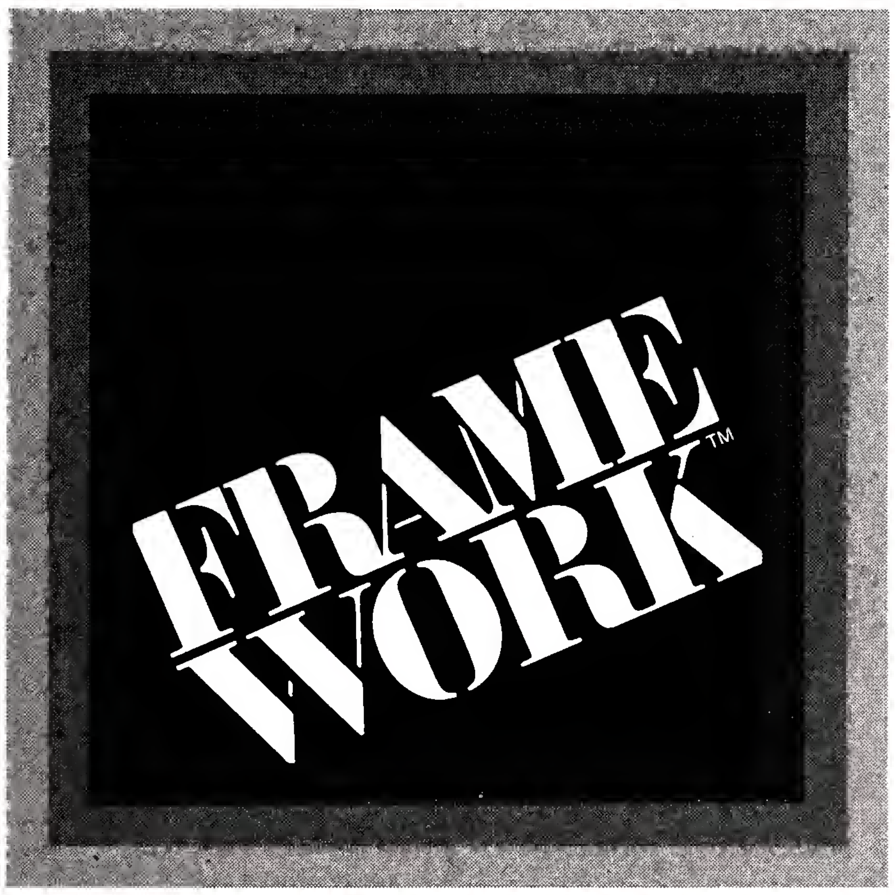
"The ability to easily create and move hierarchies of any kind of data or information is truly novel! This feature will open the personal computer to legions of users who are not solely number-oriented."

But then the experts went on to ask when they could get their hands on Framework for themselves. Especially after we told them about Fred,™ Framework's built-in applications language.

Which leads us to the conclusion that Framework is the ideal software for corporate information networks. It's easy for the first time computer user to master, but satisfies the most expert special applications writer.

Isn't that what MIS/DP managers have been waiting to get their hands on?

ASHTON·TATE™



Framework. For Thinkers.™

213-204-5570

Framework. For Thinkers., Framework, and Ashton-Tate are trademarks of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corp. VisiCalc is a trademark of VisiCorp. © 1984 Ashton-Tate. All rights reserved.

University updates systems while changing image

LOWELL, Mass. — Five years ago, the University of Lowell here found itself training a steadily increasing number of engineering and computer science students on outdated equipment.

More than half the university's students were majoring in engineering or science, and the school's computer equipment was limited to an outdated Control Data Corp. mainframe, 170 Digital Equipment Corp. Decwriters and 11 Data General Corp. Micro-Nova 16-bit minicomputers. This equipment was used for administrative purposes and to teach introductory courses in programming and computer science.

"These were manual, batch processing systems with minimal user interactivity," said Tom Costello, chairman of the computer science department and vice-president for technical resource development at the school.

"Like many older computer systems, they were slow in operation, far from user-friendly and very difficult to access," Costello said.

Change in direction

The school made moves to change its direction as well as its identity, which it did in 1975 when it merged with Lowell Tech and Lowell State College. (Lowell Tech had been a training school for the once-booming textile manufacturing industry in the area.)

A decision was made to expand graduate programs by offering a master of science degree in computer science and doctorates in engineering, health and education. When the school went shopping for equipment, primary considerations were reliability of hardware and software, communications capabilities, stable operating systems, strong price/performance and proven industry-wide acceptance of the products.

After considering equipment from CDC, DG, Prime Computer, Inc., Hewlett-Packard Co. and Wang Laboratories, Inc., the school settled on a variety of DEC computers.

Approximately $850,000 has been spent on DEC equipment so far, obtained at price breaks of 50% or more, Costello said.

One PDP-11/44 for the College of Engineering and a PDP-11/23 for the computer science department were chosen in the initial purchase. When more equipment was needed in 1982, the university obtained a number of DEC Gigi graphics terminals and two DEC VAX-11/780 superminicomputers connected through DEC's Decnet network.

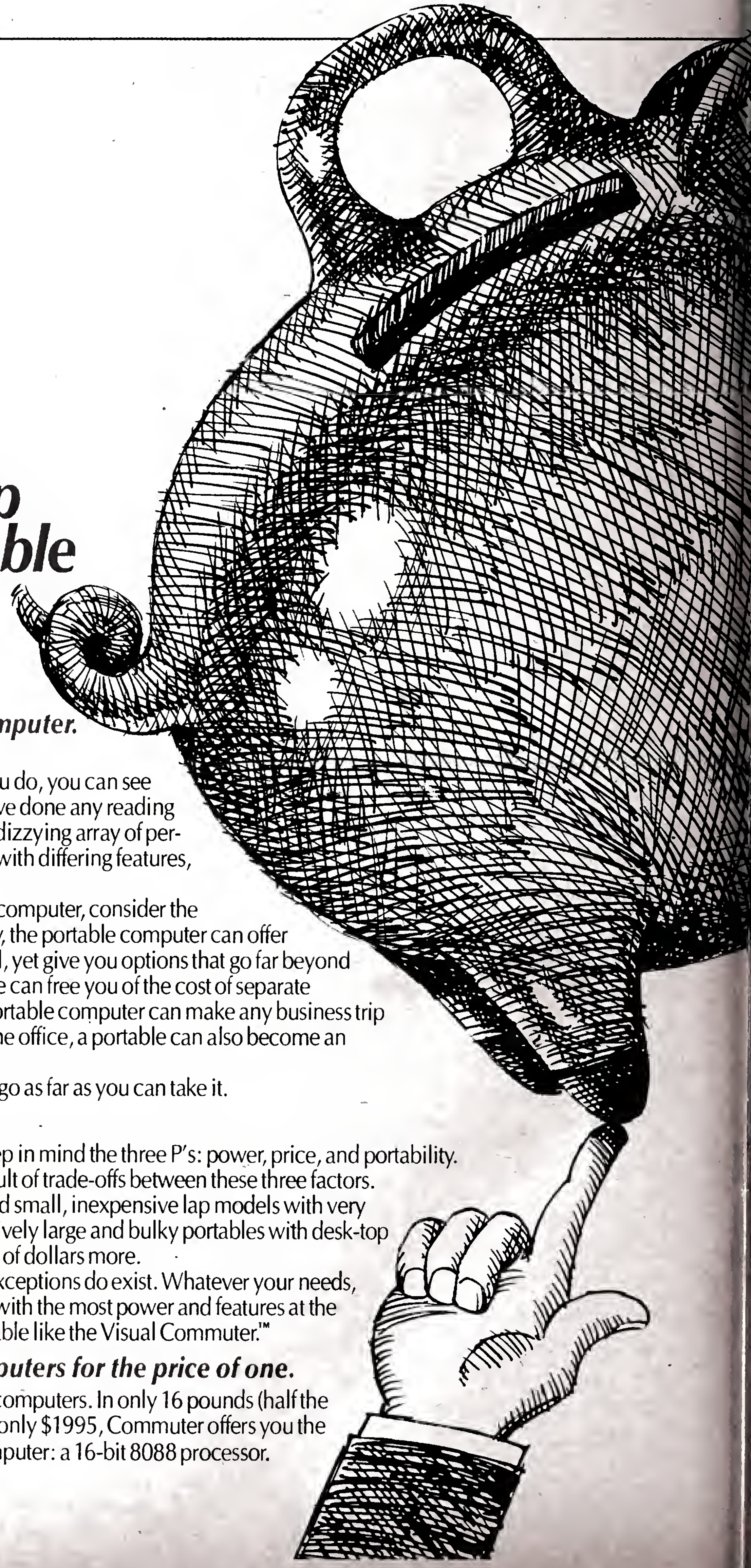
Still more equipment obtained in 1983 included a third VAX for administrative purposes, some memory and disk upgrades and dozens of DEC's new VT220 video terminals. The university has already received these terminals, which brings the number available for student use to approximately 400 — including 250 DEC VT100 family terminals.

In addition to a wide variety of computer languages and applications, the VAX computers run DEC's All-In-One office information system, which provides word and list processing, electronic mail, calendar management and electronic "file cabinets" for approximately 35 users in the computer science department and for faculty in the College of Engineering.

Costello said the office automation products have helped reduce the clerical burden on secretaries and faculty.

Costello has added a program for himself to keep track of financial information once tediously recorded on paper. He can now keep the numbers up-to-date, make changes in the financial picture instantaneously, run "what-if" analyses to gauge the impact of transactions and then switch back to the All-In-One system's menu

See **LOWELL** page 69



How to pick up the most portable computer for your money.

The advantages of a portable computer.

Personal computers.

No matter where you are or what you do, you can see how they're changing your world. If you've done any reading on the subject, you know that there are a dizzying array of personal computers on the market today, all with differing features, capabilities, sizes, and prices.

If you're planning to buy a personal computer, consider the advantages of a portable computer. Today, the portable computer can offer the same capabilities as a desk-top model, yet give you options that go far beyond your desk: If you work at home, a portable can free you of the cost of separate computers for your home and office. A portable computer can make any business trip infinitely more productive. And outside the office, a portable can also become an educational tool for your family.

The benefits of a portable computer go as far as you can take it.

Weigh the differences.

When looking at portable computers, keep in mind the three P's: power, price, and portability. Every portable computer design is the result of trade-offs between these three factors.

At one end of the spectrum you'll find small, inexpensive lap models with very limited capabilities, and at the other, relatively large and bulky portables with desk-top computer power, costing up to thousands of dollars more.

Within this broad range, however, exceptions do exist. Whatever your needs, remember: you're looking for the model with the most power and features at the lowest possible weight and price. A portable like the Visual Commuter.™

The Visual Commuter: two computers for the price of one.

Commuter is a breakthrough in portable computers. In only 16 pounds (half the weight of comparable portables), and for only $1995, Commuter offers you the same features as a powerful desk-top computer: a 16-bit 8088 processor.

Firm slashes book-closing time with general ledger tool

NUTLEY, N.J. — A manufacturer of avionics equipment here said it has cut the time required to close out its accounting books by more than half since installing a computerized general ledger system.

ITT's Avionics Division had been using a manual accounting system — namely, two-color ink spreadsheets — for nearly 16 years before deciding in 1982 that a faster and more efficient method was needed. At the time, it regularly took company accountants 12 days or more to close their books.

The division's User Control Group began looking at computerized solutions to the problem, specifically at a software package that would streamline the accounting process.

A principal requirement, the company said, was an easy-to-use product that would enable the division's 60 accountants, many of whom had little technical background, to install and operate the program.

Another reason for that requirement was that the division's data processing department had major commitments to other applications and could not be relied on for major assistance with the accounting application. Another requirement was compatibility with the division's IBM 4341 processor.

Five software vendors were originally considered. Three of those were quickly eliminated, leaving only McCormack & Dodge Corp. and Walker Interactive Products, Inc. ITT finally decided on Walker's II/GL general ledger package.

"It's freed up our MIS people to do other projects," said Tom Larkin, financial data coordinator. "The package has enabled us as financial people to take over and run the financial system."

The package reportedly integrates operational, financial and management accounting functions to allow on-line, real-time management of accounting data. The company uses the package for account updating, inquiry and updating or related balances, summarized balances, account analyses, system maintenance and option selection, budgets, forecasts, allocations history and commitments.

Through use of the program's interactive, table-driven screens, the company said it has significantly reduced its closing time — from 12 days to about three — and has increased accounting efficiency.

Purchased one year ago, Walker's II/GL reportedly provided enough flexibility so that ITT did not have to change its general ledger setup.

LOWELL

from page 68

or access the VAX and run other applications.

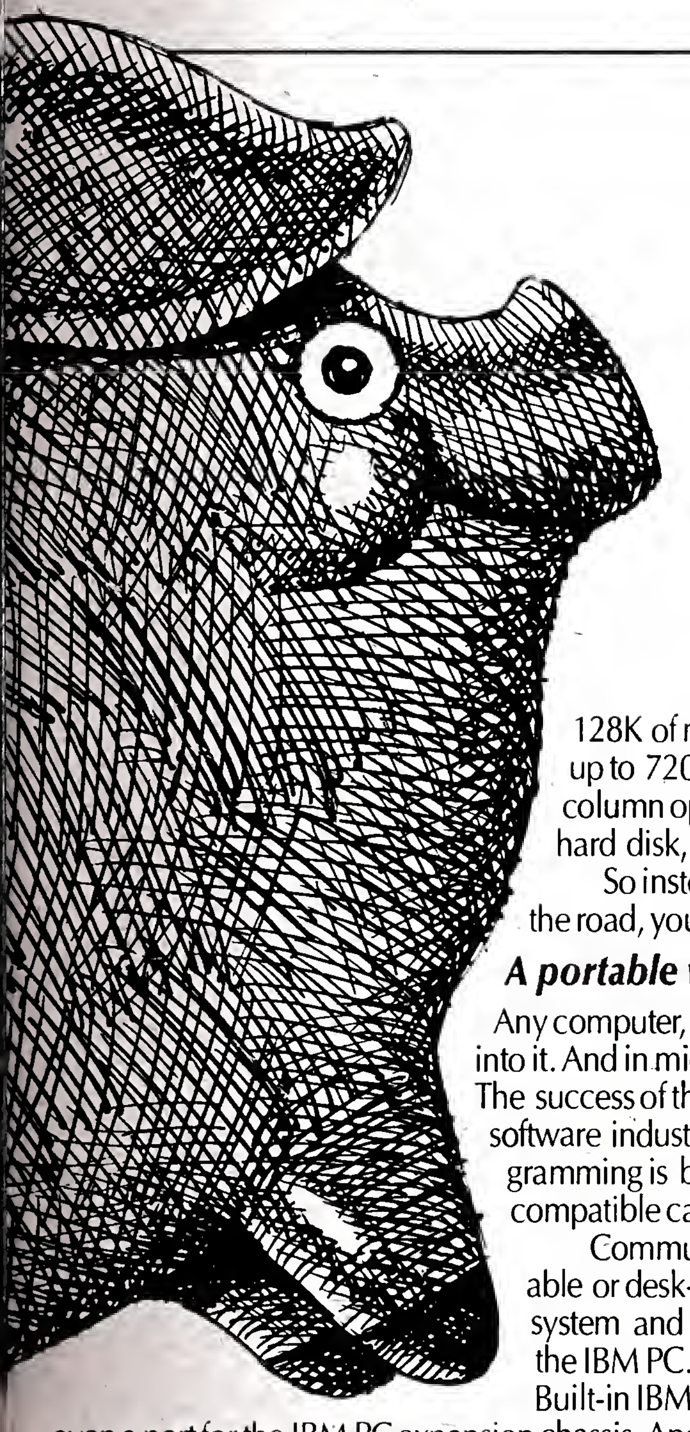
To introduce computers to inexperienced faculty members, the school added seven user-friendly PDP-11/60s in 1983, running the Decword word processing software.

The university's computer science department is now working with robotics, an integral part of its universitywide Productivity Enhancement Center, in which students from all disciplines work together on solving business productivity problems by replacing manual procedures with automated operations.

If the number of students enrolled is any indication, the new direction is working. Computer science majors have grown from 50 in 1979 to 700 in 1984. But Costello is still not satisfied.

"The reality is that we must substantially expand," Costello said. While he is satisfied with the level of support equipment, he sees a need for more equipment for dedicated applications.

In a little over five years, the University of Lowell has traveled from the past to the present and is now looking to the future.



VISUAL
Visual Computer Incorporated

128K of memory expandable to 512K. Single or dual floppy disk drives with up to 720K of storage (roughly 360 typewritten pages). A full 16 line by 80 column optional flat panel display. And expansion capabilities for printers, hard disk, communications, and external monitors, including your TV set.

So instead of buying a desk-top computer for the office and a portable for the road, you can save yourself thousands by buying a Commuter.

A portable without IBM® PC compatibility is no bargain.

Any computer, no matter how advanced, is only as good as the software that goes into it. And in micro-computers, IBM PC compatible software sets the standard. The success of the IBM Personal Computer and the resulting IBM PC compatible software industry means that today's most innovative, powerful, and useful programming is being written expressly for the IBM PC. And only a truly IBM PC compatible can take advantage of it.

Commuter offers a level of IBM PC compatibility unsurpassed in a portable or desk-top computer. With the IBM PC compatible MS-DOS™ operating system and GW Basic.™ A full 83 key keyboard with a layout identical to the IBM PC. 5¼" floppy disks that are interchangeable with the IBM PC. Built-in IBM compatible color graphics and monochrome support. There's even a port for the IBM PC expansion chassis. And unlike many so-called IBM PC compatibles, Commuter can run virtually all of the software written specifically for the IBM PC.

No computer makes $1995 go farther.

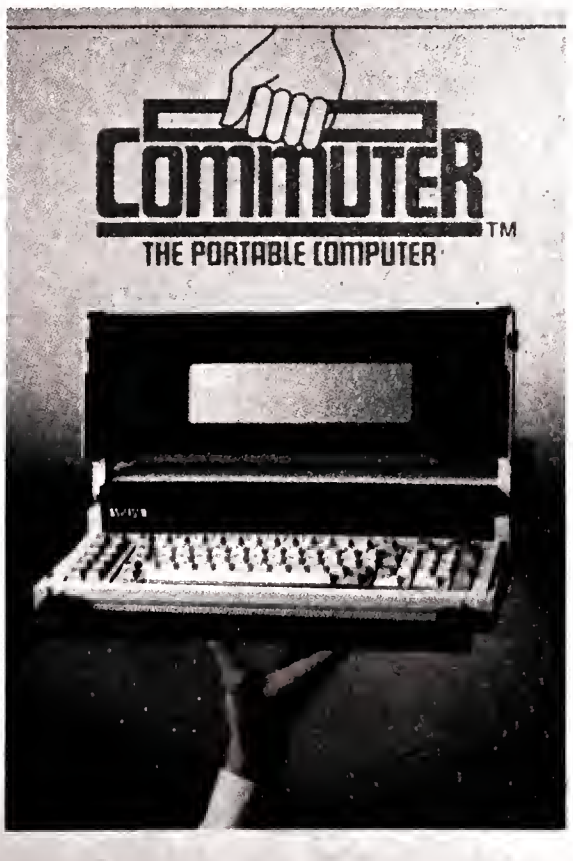
For $1995, Commuter not only gives you desk-top power and features, it does it in only 16 pounds. And at 3½" x 18" x 15" with built-in handle and carrying case, you can take it anywhere you'd take a briefcase.

For more information on Commuter, call **1-800-847-8252** (in MA call **1-800-462-5554**), or write Visual Computer Incorporated, 135 Maple Street, Marlboro, MA 01752. Or visit your local Commuter dealer today.

Commuter. Whether you compare it to desk-top models or other portables, you just can't pick up more computer for your money.

Commuter. It can take your business places it's never been.

Visual Computer Incorporated is a wholly owned subsidiary of Visual Technology Incorporated. COMMUTER is a trademark of Visual Computer Incorporated. IBM is a registered trademark of International Business Machines Corporation. MS-DOS and GW Basic are trademarks of Microsoft Corporation.



Software system helps oil firm keep track of cash flow

DALLAS — Four years ago, when Dorchester Gas Corp. here was facing high interest and labor costs plus spiraling materials expenses, the company decided to monitor carefully all activities related to cash flow.

Since the diversified energy corporation had limited data processing facilities, the company decided to take some applications to a computer service bureau. Soon, however, the company began to look for in-house software to monitor oil and natural gas exploration, contract drilling and the production and marketing of natural gas liquids and refined petroleum products.

"We needed to look at a number of concerns," explained Kenneth Rozell, senior systems analyst for the company. "The size of our staff, combined with many users, meant that we needed a reliable operating system. We needed user-friendly software because we wanted to use it with people who were not computer-oriented. And we were concerned with the training level required for the programmers who would be using the software."

Dorchester needed applications for authorizing expenditures, production reporting, drilling status and a well data base. "We did not have the staff necessary to develop those applications as quickly as we needed them," Rozell said. "And we did not want to use Cobol and basic mapping support."

Criteria were developed for the software search. "We started to investigate products that would allow pseudo-coding and free-format screen development. And we wanted adequate query capabilities," he added.

Dorchester considered six software solutions, but chose Pansophic Systems, Inc.'s Gener/ol, an interactive program development and query system designed for use under IBM's CICS. Dorchester has an IBM 4341 mainframe with the DOS/VSE operating language and a network of over 60 terminals.

Factors of selection

"In the final analysis, we felt that Gener/ol could decrease development and testing time by 75%," Rozell said. "Other factors in the selection included Gener/ol's use of command-level Cobol vs. standard Cobol, security control at owner level through field level vs. security at owner level, complete interactive capabilities, the ability to give Gener/ol to a programmer trainee vs. an experienced CICS programmer and nonseparation of applications vs. cross-referencing usage of screens."

Rozell said that since first purchasing Gener/ol, the data center has put four systems in varied stages of development using Gener/ol. The Authorization of Expenditures System and Production Reporting System track costs of drilling activity; the Well Data Base assists the engineers; and a Morning Report gives daily status of drilling on a well.

While no problems have been reported with the systems, users have still not been taking advantage of the full capabilities of Gener/ol, Rozell said. "They work principally with applications developed by the programming staff. We have developed menus and steps of menus to lead users to programs," he noted. "We have found very good results with the training of our users," for whom the software's screen development capability was developed.

THE PRINTER TO PICK WHEN THE PACE QUICKENS.

It's happening all over the PC and micro worlds.

You're getting hit with a ton of increased throughput requirements. Your applications are generating a deluge of paper. You need more printer speed. A lot more.

You're also looking for more professional-looking presentations so you need better print quality. A lot better.

Who's got the best of both worlds for you?

Okidata's Pacemark 2350 and 2410 dot matrix printers.

They'll not only help you *keep* pace with your world, they'll help you set new and exciting ones. In print speed. In print quality. And in vastly increased compatibility and capability.

Take throughput. The 2350 and 2410 can quickly get you out of the waiting game to where you're *really* cranking it out. And with flexibility, too: up to 5 pages per minute.

But wait. Cranking *what* out, you may ask? A single, restrictive printing mode? No way. The 2410 can give you DP, draft, and a correspondence quality that truly rivals the daisywheel.

And the 2350 and 2410 can both print at up to 350 cps. While producing 120 to 420 lines a minute for you. With bidirectional printing and short line seeking logic. And both high speed horizontal and vertical slew.

**PC COMPATIBILITY.
SOFTWARE COMPATIBILITY.**

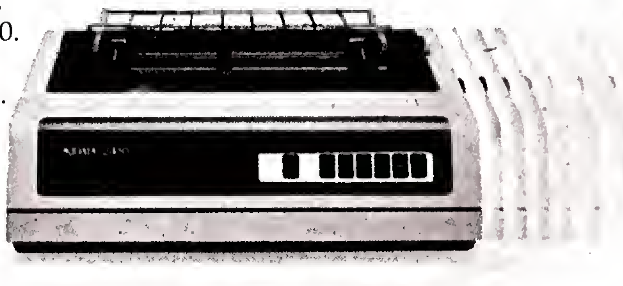
The 2350 and 2410 use industry standard interfaces making them hardware compatible with most mini and microsystems on the market today. In addition, they are supported on the menus of most of the important software being offered to microsystem users like Visicalc, Lotus 1, 2, 3, DBASE 2, Peachtree 500 and General Ledger, Multi-Mate WP, Wordstar, etcetera, etcetera.

But wait, there's more. Like an outstanding all points addressable graphics capability with 144 x 144 dots per inch resolution.

Two color printing for highlighting. Down line loadable font sets for flexibility. Subscripts and superscripts so your scientific and technical usage won't bog down. Six-part forms handling. The capability to print 132 columns on eight-inch paper using 17.1 characters per inch to save paper costs and make output easier to handle.

And—so that you can depend on getting all that good stuff, all the time—a mean time between failure of 2200 hours. A mean time to repair of only 30 minutes. An average printhead life of 200,000,000 characters. And an industry low warranty claim rate of less than 2%.

No doubt about it, the quicker the pace at your place, the more you need Pacemark from our place. For more information, call toll free 1-800-OKIDATA.
In New Jersey,
609-235-2600.
Or write
OKIDATA, Mt.
Laurel, NJ
08054.



OKIDATA
an OKI AMERICA company
We're keeping pace with your business.

Bank credits software with providing competitive edge

TRENTON, N.J. — Deregulation in the banking industry has introduced competitive pressures that a few years ago were undreamed of by most banks. As traditional sources of income, especially net interest margin, continue to shrink, financial institutions must either use creative approaches to build income in other areas or fall victim to the current shakeout in the financial services industry.

One bank that wasted no time adapting to the new competitive environment is New Jersey National Bank (NJNB), headquartered here. This $1.4 billion institution has chosen technology as one of its key weapons in the search for optimum profitability.

"Being able to adapt quickly to rapid changes in products and pricing is a key to our continued success," said Stephen R. Walker, senior vice-president of the information services division. "Using our technological resources, we can constantly monitor such things as cash flow and product and customer profitability and react immediately to any deficiencies that we find and to new opportunities that we discover."

NJNB is one of the largest commercial banking institutions in the state, with 1,200 employees and 55 offices in nine central and southern New Jersey counties.

Uses Uccel products

NJNB currently uses 10 products from a line of financial software from Uccel (formerly University Computing Co.), based in Dallas. "We are working continuously toward the further integration of our applications, enabling us to identify the entire profile of a customer," Walker said. "We're using our extensive capabilities to shape our products to our customers' needs and to ensure our profitability by monitoring vast amounts of information and reacting quickly to what we find."

Walker mentioned three Uccel software products that were crucial to the success of the bank's technological adaptations: Super Micr, Deposits and Profitability. Each has given the bank control over specific segments of operations.

Cash float — the delicate balance of incoming and outgoing funds to make available to customers the most cash in the quickest possible time — is an area of increasing concern for the bank. NJNB utilizes Uccel's Super Micr software to process checks and to decide where they should be sent for maximum cash availability.

"Checks are read by IBM 3890 sorters," said John T. Pensabene, assistant vice-president of systems development at NJNB. "Using Super Micr, we determine where to route the checks to achieve optimum availability of funds, whether it's a local clearinghouse, the Federal Reserve System or correspondent banks."

Pensabene mentioned several characteristics that make Super Micr particularly useful. "The tables in Super Micr are easily maintained by the user community," he said. "Also, the on-line reject reentry feature enables rapid reentry of unreadable checks and correction of out-of-balance deposits after evaluation. In addition, we can release a portion of our work before we've completed every application."

NJNB teams Super Micr and the Cash Management Reporting System to control and report on cash availability. Using the two systems, NJNB can offer current fund availability information to corporate treasurers at any time, giving managers a decision-making advantage in investing and routing corporate funds.

"Our Uccel Deposit software allows flexibility in packaging products to meet our customers' needs," Walker said. "Also, the deposit application allows us to build service charges around each package of

See **NJNB** page 72

NJNB's John T. Pensabene (left), Joan Hogan (center) and Stephen R. Walker (right).

Relational alone doesn't cut it.
Satisfying the needs of an information analyst takes more than just a pretty face.

SIR/DBMS delivers muscle...
A complete, relational database management system plus unique features to manage and analyze empirical, research, and decision-oriented data:
- Easy ad hoc query and reporting with SQL
- Fast, efficient programming with a fourth-generation language
- Unmatched portability across 20 mainframe, mini and micro systems
- Comprehensive data integrity and quality control
- Support of hierarchical, network, and relational views of data
- Direct interfaces with all major statistical software packages
- Flexible report generation, including camera-ready tabular displays

...for the most demanding brains
Since 1976 SIR, Inc. has pioneered the development of database software for information analysts. Market research analysts, statisticians, quality assurance engineers, medical researchers, environment specialists, and other data analysts use our system at installations of over 300 clients worldwide. A full range of technical support and training services is available to you.

Flex your muscles. Reach for SIR/DBMS.
Call or write: Director of Sales, SIR, Inc.
820 Davis Street, Evanston, IL 60201

Meet us at
INFO/SOFTWARE
in Chicago
June 12-14

SIR/DBMS, a cut above relational
312-475-2314

SIR

NJNB

from page 71

products."

Joan Hogan, vice-president of liability operations at NJNB, stressed the importance of the master information and control file, a part of the deposit system that interfaces with other deposit applications. "The master file is similar to a bank control file, but is far more flexible," she said. "It is something of a home base that allows us to make changes to any number of features of an account."

Hogan continued, "Our users can introduce new products using the master file without going through our program development department. This is extremely important in light of the rapidity with which we must react today. We save time, money and paperwork each time we introduce a new product or change a customer's account or account package."

On-line capabilities

With on-line maintenance and inquiry capabilities, the deposit system eliminates masses of input forms and allows for instant changes to account status, such as placing stops, holds or restrictions. It allows for on-line access to information to satisfy customer inquiries, maintaining 14 days of customer transaction history, according to Hogan.

"Equally important in today's competitive environment is the ability to profile a customer's deposit relationships and to determine products he doesn't have which we might cross-sell to him," Walker said. "The inquiry capabilities of the deposit system also help us here."

"Our Uccel Profitability software allows us to monitor and react to individual customer profitability as we watch the emphasis in banking move from interest income to fee income, including service charges," Walker said. "We're primarily using it with corporate customers at this time, but will be evaluating individual-type accounts soon."

Provides flexibility

Integrated with the deposit system, the profitability system provides flexibility in addressing product and pricing changes. Using the system, NJNB can evaluate the profitability of specific customers in building an overall picture of the most profitable centers in the bank.

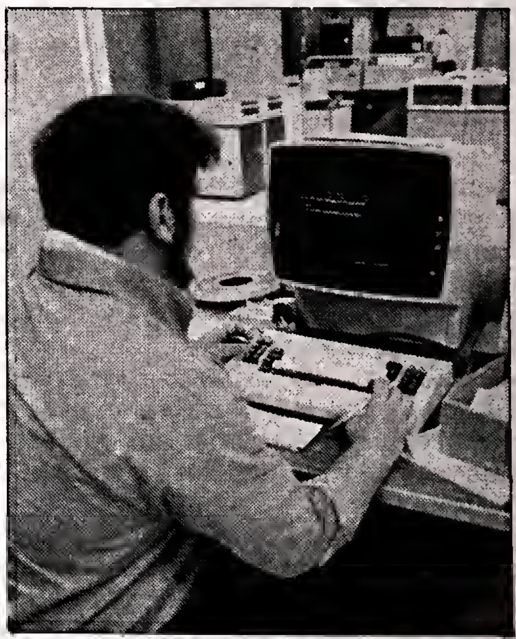
The system can measure profitability according to any preestablished criteria, check, deposit or monthly charges. It can also apply service charges to accounts through the deposit system.

NJNB's software operates in an IBM environment. The bank currently uses an IBM 4341 Model 12 as well as an IBM 4341 Model 2.

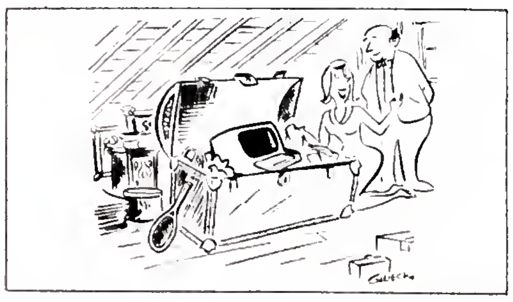
"We reduced our full-time staff by 15," Hogan said. "Our strategy is to build on our existing products with new offerings. This keeps us flexible enough to change with the demands of the marketplace."

"We are very pleased about what technology is doing for us to help keep us flexible and current," Walker said. "We really feel that this is one of the keys to maintaining a strong position in our increasingly competitive financial services industry."

> *"The master file is similar to a bank control file, but is far more flexible. It is something of a home base that allows us to make changes to any number of features of an account. Our users can introduce new products using the master file without going through our program development department. This is extremely important in light of the rapidity with which we must react today. We save time, money and paperwork each time we introduce a new product or change a customer's account or account package."* — Joan Hogan, vice-president of liability operations at NJNB.



The computer room at New Jersey National Bank.



Give your PC some exciting new personalities.

Our EtherGuide™ seminar-on-a-diskette will show you how.

This diskette seminar demonstrates how easy it is to get into personal networking. With 3Com's EtherSeries™ The effect is dramatic. Instead of a solid, useful, but limited business assistant, your PC shows its true potential.

In a local area network, you and your PC take on a series of exciting new personalities. You become a better business consultant, secretary, messenger, meeting planner, graphic artist, author, financial analyst, executive, and friend.

You'll be able to reach out to colleagues with electronic mail, using our award-winning EtherMail™ Share data bases, printers and plotters, while running hundreds of leading programs such as 1-2-3™ from Lotus™ WordStar,® VisiCalc,® dBase II® and MultiPlan.®

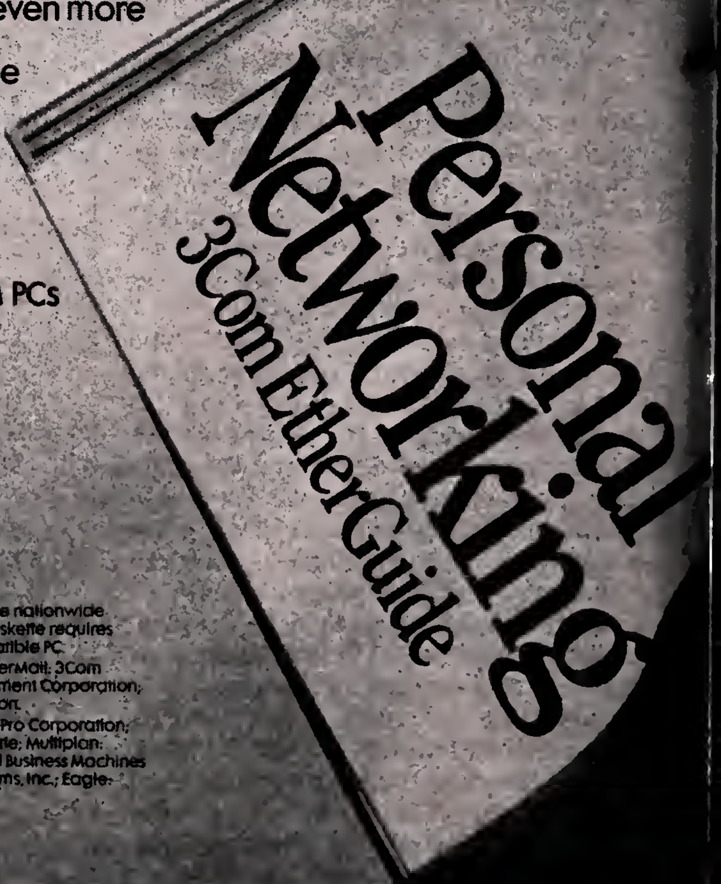
Our EtherSeries hardware and software packages make the industry-standard Ethernet even better. And it's about the same price as slower, less powerful networks. You don't have to tie up a PC as a server, either. Or buy a disk for every PC. So that saves you even more money.

No wonder it's the choice of Hewlett-Packard, Texas Instruments and Zenith for their own network products. As well as hundreds of companies using IBM PCs and most compatibles, such as COMPAQ,™ TeleVideo® and Eagle.®

So find out how easy it is to get into personal networking. Send in the coupon and a check for $10—that's $10 off the usual $20 price. Or just check the box for complete information on how to do your personal best.

3Com

The personal networking people



3Com EtherSeries products are available nationwide at full-service PC retailers. The seminar diskette requires graphics capability on an IBM or compatible PC.
Trademarks: EtherGuide, EtherSeries, EtherMail: 3Com Corporation; 1-2-3, Lotus: Lotus Development Corporation; COMPAQ: Compaq Computer Corporation.
Registered trademarks: WordStar: MicroPro Corporation; VisiCalc: VisiCorp, Inc.; dBase II: Ashton-Tate; Multiplan: Microsoft Corporation; IBM: International Business Machines Corporation; TeleVideo: TeleVideo Systems, Inc.; Eagle: Eagle Computer, Inc.

Language-directed editors ease programmers' work

Selection criteria can help managers choose the right editor for their firms

By Homi M. Byramji
Special to CW‡

Language-directed editors are a new generation of intelligent editors that substantially speed up program entry and debugging. These editors check statements as they are entered, identifying syntax errors and other common coding mistakes.

A good language-directed editor also checks for undefined variables and statements with mismatched variable types. If this checking is thorough enough, programs should compile on the first try. This should serve to reduce program development time and increase programmer productivity.

> *Most language-directed editors can generate an entire program structure — an outline listing the statements permitted by the language, in the proper sequence — and they do so with a single keystroke.*

Most language-directed editors can generate an entire program structure — an outline listing the statements permitted by the language, in the proper sequence — and they do so with a single keystroke. Items listed in the program structure, called placeholders, then reserve space for the entry of a particular statement type. Programmers code by moving to each placeholder and either expanding or eliminating it as required.

For instance, at one statement placeholder, the programmer requests an IF-THEN-ELSE statement. The language-directed editor then generates the format and syntax for this statement with new placeholders for conditions and clauses. The programmer then simply fills in the blanks.

Statement templates reduce the number of keystrokes required to enter a program and free programmers from syntax details. Programmers can concentrate on the program logic instead.

Users should not confuse language-directed editors with program generators. While language-directed editors perform many of the tedious chores associated with programming, they will not write programs. The programmer still has to design the programs, define the variables and select the statements to be used.

The first language-directed editor was developed at Cornell University in Ithaca, N.Y., as a research project. Dr. Timothy Teitelbaum developed the Cornell Program Synthesizer — a PL/I editor that ran on a Terak Corp. microcomputer. Later, Nicos Habermann at Carnegie-Mellon University in Pittsburgh developed the first Pascal editor, called the Gandalf A Language-Oriented Editor.

Both early editors were developed with the twin goals of teaching students how to program and increasing programmer productivity. Studies with control groups showed that students using language-directed editors completed their assignments in about half the time of the group that did not have such tools.

This educational orientation influenced the present generation of commercial language-directed editors. Their menu prompts help students program without constantly referencing manuals. The automatic generation of statement syntax lets students focus on programming concepts, and the error checking gives them immediate feedback. Increased success in writing correct programs gives students greater confidence in their work. These features also make language-directed editors useful to programmers working in languages new to them, making them productive right away.

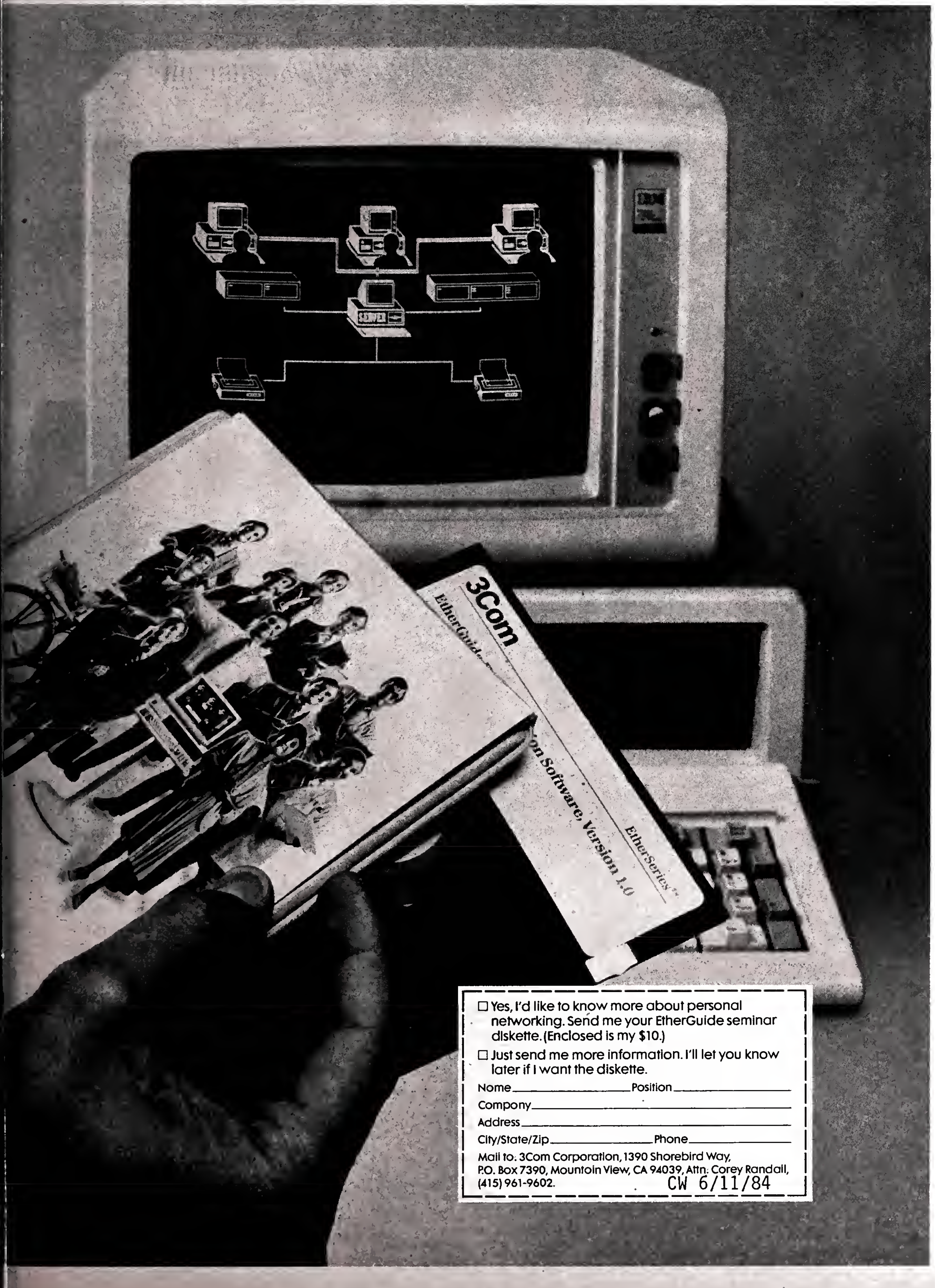
If you are thinking of buying a language-directed editor, make sure that it supports the compiler you are using. You might order a demonstration diskette (most manufacturers offer a demonstration copy for a nominal fee that is later offset against the purchase price) and evaluate it against the following criteria:

■ How thorough is its error checking? Error checking is where you will achieve the greatest time savings, and so it is the most important factor in the selection of a language-directed editor. In addition to syntax checking, the language-directed editor should check for undefined variables and do type checking — including the checking of function and procedure arguments.

■ Can the editor accept existing

See **EDITORS** page 76

Byramji is vice-president of Spruce Technology Corp., a developer of language editors based in Lincroft, N.J.



☐ Yes, I'd like to know more about personal networking. Send me your EtherGuide seminar diskette. (Enclosed is my $10.)
☐ Just send me more information. I'll let you know later if I want the diskette.
Name__________ Position__________
Company__________
Address__________
City/State/Zip__________ Phone__________
Mail to: 3Com Corporation, 1390 Shorebird Way, P.O. Box 7390, Mountain View, CA 94039, Attn: Corey Randall, (415) 961-9602.
CW 6/11/84

University takes dual approach to cutting backlog

User programming, fourth-generation tools help school fulfill requests before it's too late

CHICAGO — Much of the work in MIS entails satisfying ad hoc, one-time requests for information or developing new reporting applications and changing old ones. These requests are often easily accomplished, but their volume swells the MIS work load. This is a common MIS nightmare, but the true nightmare is not that MIS is backed up; the nightmare is that by the time MIS can respond, the deadline for the request for information has passed, and the request has aged into obsolescence.

Letting user requests age past deadlines might be an effective way to reduce the MIS work load, but it is dangerous — it endangers the organization because information is not available when needed, and it endangers the MIS reputation. Many different schemes have been employed to resolve this problem — from information centers to personal computers to guaranteeing development programmers subsecond response time — but still the volume of user requests outpaces the responses.

The University of Chicago here recently installed financial accounting and accounts payable packages. While these products are good and offer sophisticated, on-line, menu-driven queries and reports and facilities for ad hoc queries, the university anticipated that many users' future needs would not be met by the base packages. This is not unusual to any new application and, of course, creates much of the MIS turnaround delay.

Unfortunately, given the tight fiscal constraints universities face and the need for careful financial management, users could not afford any significant lag time between a request for service and the production report. At the same time, the university could not afford to hire new programmers, even if it was possible to find qualified and experienced candidates.

The university's approach to this problem was twofold: the university moved some of the responsibility for handling ad hoc inquiries to its user departments, and it made use of fourth-generation software products, particularly their graphics capabilities. The experience with both of these tactics has been extremely rewarding, according to a university spokesman.

The vendor provided a report writer as part of its product line, and the university purchased it for a definite purpose: to meet the demand for one-time requests for information. From the outset, the intent was to shift responsibility for these requests to the functional user areas that generated them.

Supervisors and line managers in selected user departments were invited to three-day training sessions to learn how to use the report writer, and they were not abandoned after the sessions. Programmers trained alongside users in these sessions so that experienced professionals were available for support.

Program a success

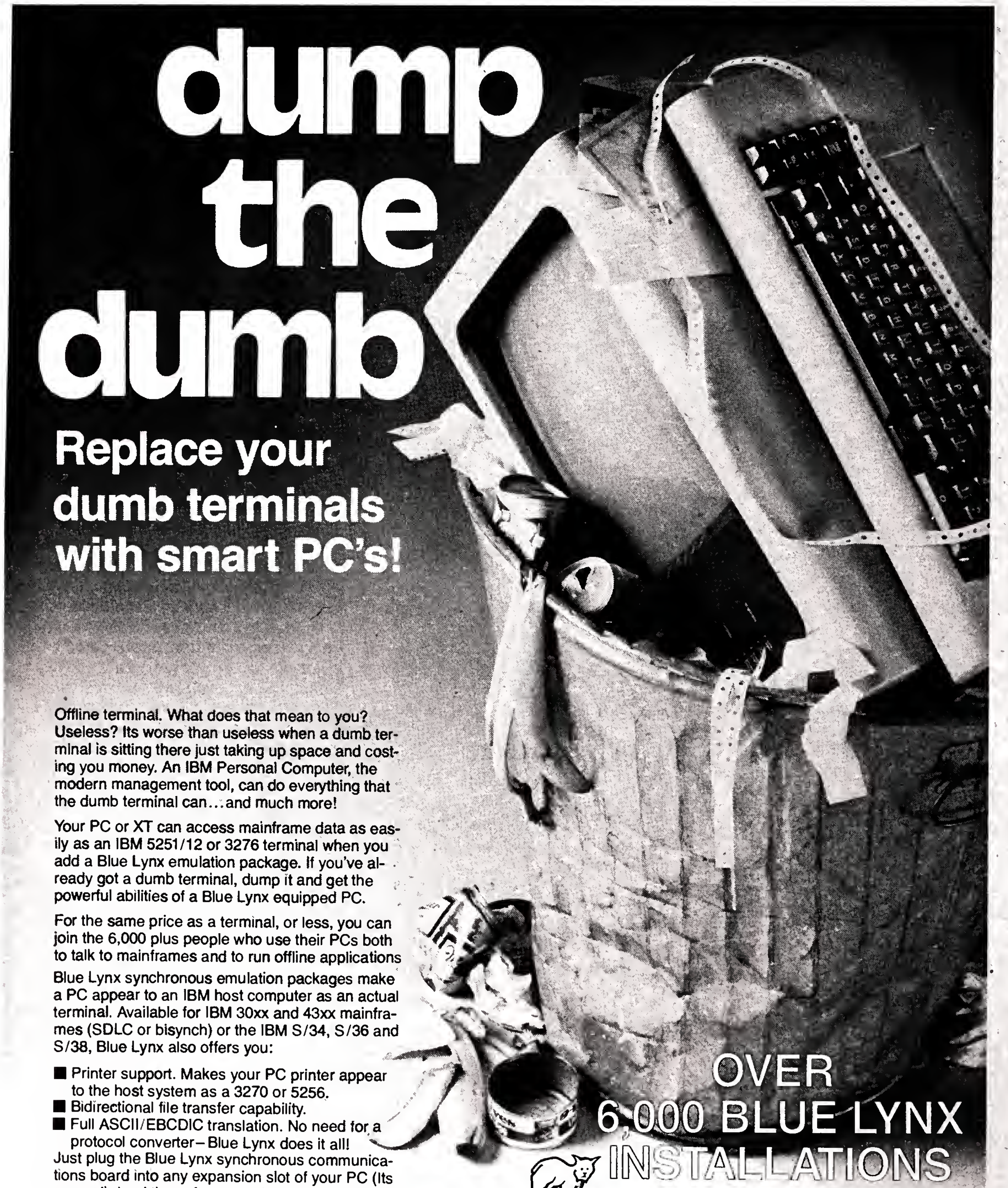
The program was successful. One-time, ad hoc requests are satisfied where the need for information and its use are most urgent and clear. By seeding some technical skills in user departments, the university has held down the number of these requests. MIS resources are left open to concentrate on more complicated needs.

This strategy is quickly becoming the norm. In a recent survey done at the Sloan School of Management at MIT, researchers found that of the companies they surveyed, "the bulk of the systems (approximately 48%) being used by end users are being developed by local functional support personnel." The researchers defined functional support personnel as "individuals who, by virtue of their prowess in end-user languages, have become informal centers of systems design and programming expertise within their functional areas." They went on to suggest that this kind of computing will consume as much as 75% of corporate MIS in the next few years.

Whether this prediction is correct is not important. The importance of the experience and of the survey's findings is that technical skills can be cultivated in user areas and can be relied on. For this effort to be successful, it is vital that MIS participate in the process and be prepared to support it. User departments are keenly interested in assuming some of the MIS function, and they are doing it.

If MIS professionals do not work with these departments, resources could be used inefficiently, and the resulting data might be used incorrectly. If MIS is blind to the need, what might have been a very effective way of improving request turnaround could make more work for MIS. Corporate policy can be made at two points: before or after the fact of end-user computing. If done after the

See **CHICAGO** page 76


dump the dumb
Replace your dumb terminals with smart PC's!
OVER 6,000 BLUE LYNX INSTALLATIONS

Offline terminal. What does that mean to you? Useless? Its worse than useless when a dumb terminal is sitting there just taking up space and costing you money. An IBM Personal Computer, the modern management tool, can do everything that the dumb terminal can...and much more!

Your PC or XT can access mainframe data as easily as an IBM 5251/12 or 3276 terminal when you add a Blue Lynx emulation package. If you've already got a dumb terminal, dump it and get the powerful abilities of a Blue Lynx equipped PC.

For the same price as a terminal, or less, you can join the 6,000 plus people who use their PCs both to talk to mainframes and to run offline applications

Blue Lynx synchronous emulation packages make a PC appear to an IBM host computer as an actual terminal. Available for IBM 30xx and 43xx mainframes (SDLC or bisynch) or the IBM S/34, S/36 and S/38, Blue Lynx also offers you:

- Printer support. Makes your PC printer appear to the host system as a 3270 or 5256.
- Bidirectional file transfer capability.
- Full ASCII/EBCDIC translation. No need for a protocol converter–Blue Lynx does it all!

Just plug the Blue Lynx synchronous communications board into any expansion slot of your PC (Its a snap!), load the software and you're ready to go.

Blue Lynx 3276 Emulation SNA/SDLC or Bisynch.
Blue Lynx 5251/12 Emulation for S/34, S/36 and S/38.
Either Blue Lynx hardware/software package–$690
Combination of two emulators–$1230
ETU–Emulator Transfer Utility allows either upload or download of files between a PC and a S/34, S/36 or S/38–$500 or $800
Multi Lynx Port Expander–Gives you 8 communications ports where you just have one—$1390
VTERM–Asynchronous communications and DEC VT-100 emulation–$125

Make the micro-to-mainframe connection

(212) 684-7788

Telex 961134

TECHLAND
SYSTEMS INC.
25 Waterside Plaza, New York, N.Y. 10010

See us at
PCExpo

6/84

Blue Lynx 5251 is a joint development of Software Systems, Inc. Jefferson City, Mo. and Techland Systems Inc.

The Inspector IV MPC, The Detector II and Protector:*

Super Stars

Now available for OEM,
contact Director of OEM Sales.

These Media Management devices from Graham Magnetics keep your computer tapes performing better, longer.

Graham Magnetics' leadership position in computer tape technology has led to the development of three remarkable devices, each designed to do a specific job to reduce drop-outs, tape damage, stoppages and resulting system downtime:

The Inspector IV* MPC—This microprocessor-controlled tape evaluator/cleaner locates and isolates error-prone and damaged tape in your library. It can clean and evaluate a 2400′ tape in just 3.6 minutes.

The Detector II*—Also microprocessor-controlled, this tape cleaner uses proprietary vacuum-grid cleaning technology to remove most error-causing contaminants. It can clean, retension and rewind a 2400′ reel in 3.3 minutes.

The Protector*—This patented cleaner employs vacuum technology to remove error-causing debris, including micron-sized particles, from the inside of self-loading cartridges. It automatically adjusts to clean most cartridges in two minutes or less.

Graham Magnetics' position is simple: Put Epoch 480* computer tape in your library, then utilize our Media Management Program© to keep it in top shape. With Graham "Super Stars" in place, your media will last longer and run virtually error-free.

*Registered trademarks of Graham Magnetics Incorporated.

Act Now!—to improve your data center's productivity:

Marketing Services, Graham Magnetics
Incorporated, 6625 Industrial Park Blvd.,
North Richland Hills, Texas 76118

Please send me information on the following Graham Magnetics products:

☐ Complete Media Management Program
☐ Inspector IV ☐ Detector II ☐ Protector
☐ Epoch 480 "Permanent" Computer Tape

Name: ____________ Title: ____________
Company/Organization: ____________
Address: ____________ Phone: ____________
City: ____________ State: ______ Zip: ______

GRAHAM MAGNETICS CARLISLE

Toll Free: 1-800-433 7632, 433 7633 In Texas: (817) 281 9450

CHICAGO

from page 74

fact, MIS will likely be charged with the duty of coordinating a hodgepodge of end-user data needs and applications.

The key to success is planning. Many attempts to provide users with computing tools are poorly planned, with the result that MIS is not in touch with the direction of user departments, and user departments feel at odds with MIS. The university's approach has been phased, using well-trained and MIS-supported supervisors and line managers as the first wave of user programmers. After their skills have been put to good use, and after the idea of non-DP personnel acting in traditional DP roles has been accepted, the university intends to introduce more end-user software tools to these user departments. The university's next step in this process will be to introduce selected departments to SAS Institute, Inc.'s Model 204 (a data base management system with advanced query facilities). With it, using data preloaded into the data base for them, they will be able to perform their own analyses interactively.

The experience with these end-user software products does not stop with their introduction to user departments. These products have made their way into traditional MIS applications development. The university has used SAS from SAS Institute to supplement or replace reports from two new applications. It has found the data summary and graphics capabilities of SAS to be cost-efficient while at the same time making needed information more easy to understand.

An important part of the payables function is to control the movement of cash out of an organization. Without this control, a company might occasionally find itself with a negative cash flow. The university's base payables system provides detailed reports that address the need to control cash, but the school had two problems with these reports: their format and their bulk. The university was asked to present the same information in summary form and to add more information by detailing the kinds of cash commitments due.

These reports fit on a single page and present all the information necessary to oversee cash commitments. Deriving this same information from the base system's package used to be an all-afternoon task. Now, a decision about the kind of payments to make on a given day can be made in seconds. The estimate for programming this in Cobol was four to five man-days. With SAS, these reports were in production after 10 man-hours, and their format made them easier to understand and use.

The university does not view SAS or any end-user, fourth-generation or nonprocedural language as a complete answer to backlogs. It does see such tools' efficiency in a coordinated approach to meet users' information needs. Perhaps the most vicious myth concerning these new products is that they can solve all problems and address all needs — that the magical products will satisfy every request. In fact, they cannot. But as new tools, applied carefully and discretely and as a defined part of an information plan, they can and do help in getting work done.

EDITORS

from page 73

programs developed with other editors? It should. You will certainly want to use the same editor to maintain your existing programs and develop new ones.

■ Is the editor flexible enough so you can enter statements directly without having to use the automatic statement generator? When entering simple statements like assignment statements, it is easier and faster to type them in directly.

■ Is the program tolerant enough to let you ignore an error and continue? This is very important in two situations: if the cause of the error lies somewhere else or if you are not certain of the cause of the error and wish to get help or research it another time.

■ Can you easily change a statement already entered? Say you entered a WHILE loop and later find that a different statement, perhaps a REPEAT UNTIL block, should have been used. If the editor does not permit you to change the statement, you will have to delete and reenter it. This can be very cumbersome.

■ Will the language-directed editor accept INCLUDE programs? Languages such as Pascal and C allow other files to become part of the program by referencing them in an INCLUDE statement. The language-directed editor should check the contents of these files to ensure that there are no errors in them or in the main program as a result of them.

■ Will the editor automatically and consistently indent your programs as you enter them? This makes them much easier to read and is an important step toward more uniform programming practices.

■ How clear are error messages? The language-directed editor should describe errors fully and suggest possible corrective action.

■ Is there any size limitation on the programs that can be edited? Ideally, there should be no restriction on the size of the program.

■ Does the editor work at least as fast as you do? It should not make you pause after every statement while it checks the syntax and variable definitions. A language-directed editor should speed up your programming, not slow you down.

■ Does the editor have unique features and programming aids? Some editors have additional features that facilitate program debugging.

END USERS WHO DO IT
CERTAIN

INTRODUCING AURA.
THE MOST ADAPTABLE
SOFTWARE
YOU CAN BUY.

It's no secret that personal computers can help reduce your applications backlog. But only if you have software that can make every one of your end users self-sufficient.

Which means that one software package has to handle an endless variety of applications, store and retrieve data with complete flexibility, and adjust to the experience levels of hundreds, or even thousands, of individual users.

That software is Aura. In fact, Aura is the most adaptable software you can buy. With Aura, users can create their own menus to define entire sets of tasks. Stream jobs together to complete a series of operations with a single keystroke. And operate their IBM or similar personal computers without having to learn or remember a single command.

In short, Aura lets your end users do it themselves.

DATABASE CORE

Aura takes an approach that redefines the structure of personal computer software. Because its database provides central information storage from which graphs, word processing documents, and spreadsheets can be built.

In addition, when a field is added or changed, all files are automatically reformatted, without rekeying. Related graphs, documents, and spreadsheets are updated as new data is entered, changed or deleted.

The number of files and records are limited only by disk capacity. Aura supports records of up to 255 fields with 255 characters each. Each record can have up to eight indexes. And each index is built automatically in an advanced multiway tree structure.

3D SPREADSHEETS

Aura's 3D spreadsheets offer capabilities that aren't just innovative. They're unique.

Consider that an unlimited number of Aura's 255 row by 63 column spreadsheets can be linked together at the touch of a key. And that with Aura's ZOOM feature, a user can instantly inspect the details behind any cell of information derived from any other spreadsheets.

Spreadsheets can even be created from existing database information and then turned into graphs or charts.

FREE-FORM AND
BUSINESS GRAPHICS

Aura's high resolution graphics also let end users do it themselves. In fact, they can draw their own graphics interactively or call them up ready-made from a menu.

And it's easy to design everything from organizational charts to corporate logos. Because while free-form graphics are being created, the menu remains on the screen to guide the user along.

Business graphs can be generated from information in the database, a spreadsheet or directly from the keyboard. And prepared graphs and charts can reflect figures from a given point in time or from the most current information in the database or spreadsheets.

When the graphic elements are completed, one or more of them can be automatically integrated into a single page or pages of a word processing document.

Hardware requirements are only 256K of internal memory with either a hard disk and one double-sided, double-density floppy disk drive, or two double-sided,

Workstation seen boon to programmer productivity

By Mark E. Mayer
Special to CW‡

The personal computer explosion has caused many companies to take a closer look at the benefits of micros in the corporate environment. Many see the personal computer as an end-user productivity tool, a super word processing machine or an electronic mailbox.

But what about as a programmer productivity tool? Many of our data processing gurus have been saying that programmer productivity has been increasing at a woefully inadequate rate and that this trend must be turned around if we are to compete successfully in the marketplace. This trend must also be reversed to provide for the ever-increasing demands of the end-user community. To change this trend, programmers need better tools to perform their jobs.

Many programmers want to do a good job but can't seem to keep their momentum up because they are frustrated by inadequate or improper tools, poor response time and system availability, vague user requirements and specifications and inflexible and time-consuming methodologies. A lot of pressure can be heaped on a programmer attempting to finish coding a routine before the system goes down again on a poor program editor with a response time of around 10 seconds, especially when the user is looking over one shoulder saying, "Let's try it this way instead," and a quality control inspector is looking over the other saying, "The methodology calls for this first."

This frustration can lead to a further drop in productivity and high employee turnover as programmers seek less hostile environments. Many of these problems could be improved or corrected with a programmer workstation and the proper software tools.

A programmer workstation is a personal computer with a set of integrated hardware and software development tools to help programmers perform their jobs faster and more accurately than before. Since much of the programming done for large companies today is on and for a mainframe computer, the workstation will require a communications link to that computer. The workstation can then relieve the main computer of the task of editing system documentation and generating and compiling source code. The only time the programmer will need to worry about system availability is when communicating with the main computer.

The workstation will also need a high-speed storage device, such as a hard disk drive, for storage of programs and documentation.

What software components will be needed for the programmer workstation? Completely integrated and flexible tools with an automated methodology that can communicate with each other and generate an entire system from initial design to program code.

A data dictionary or an interface to the main computer's data dictionary is a necessity for any workstation performing automatic system generation. The data dictionary will describe the data for the other software components so they will know what the data is and what it looks like. There must be a common interface to enable communications with all the other software components.

System design tool

Also necessary is a system design tool flexible enough to create any type of system (interactive or batch) in a very high-level specification language. These specifications will generate and combine all system documentation such as data flow diagrams, file and data base descriptions, interfaces to other systems and so forth. It will eventually link to a source code generator and a screen generator for interactive programs.

A source code generator will pick up where the system design tool leaves off. It will generate source code from the specifications, point out where the specifications are flawed and prompt the programmer for any additional information it may need. The code generator should also have some facility for using any precoded routines from a library so they do not have to be reinvented.

A screen generator will also communicate with the system design tool and the source code generator. It should be powerful enough to use as a prototyping tool so the end users can specify their own screens, try out their ideas and have direct input into the design of the system. It should also have the capability of specifying edit information for fields or for retrieving that information from the data dictionary.

The items described above are already available in one form or another from a number of firms, but few vendors have come up with integrated packages that will satisfy all the requirements. Many other tools to boost productivity, especially in the area of existing program maintenance and report generators, could be created from these initial tools.

Mayer is an independent DP consultant and president of Sojourn Systems, Inc. in Lansing, Mich.

THEMSELVES HAVE A AURA.

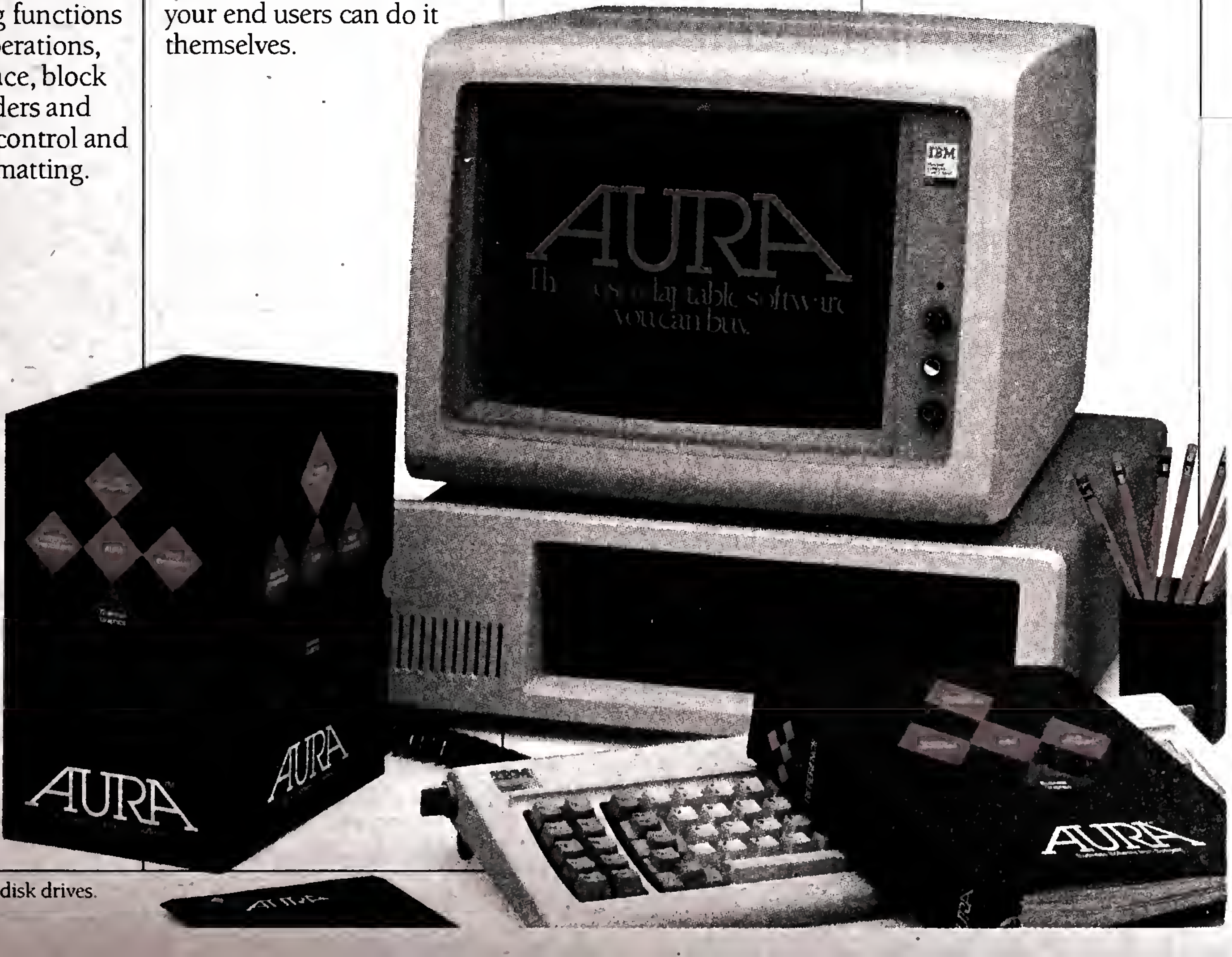
WORD PROCESSING
With Aura's word processor, it's easy to insert database, spreadsheet or graphic information into the middle of a report, letter or memo. And form letters can be automatically addressed with names on file in the database.
Words, phrases or pages can also be moved between documents. And users can edit multiple documents concurrently.
Just a sampling of Aura's word processing functions include ruler operations, search and replace, block operations, headers and footers, printer control and automatic reformatting.

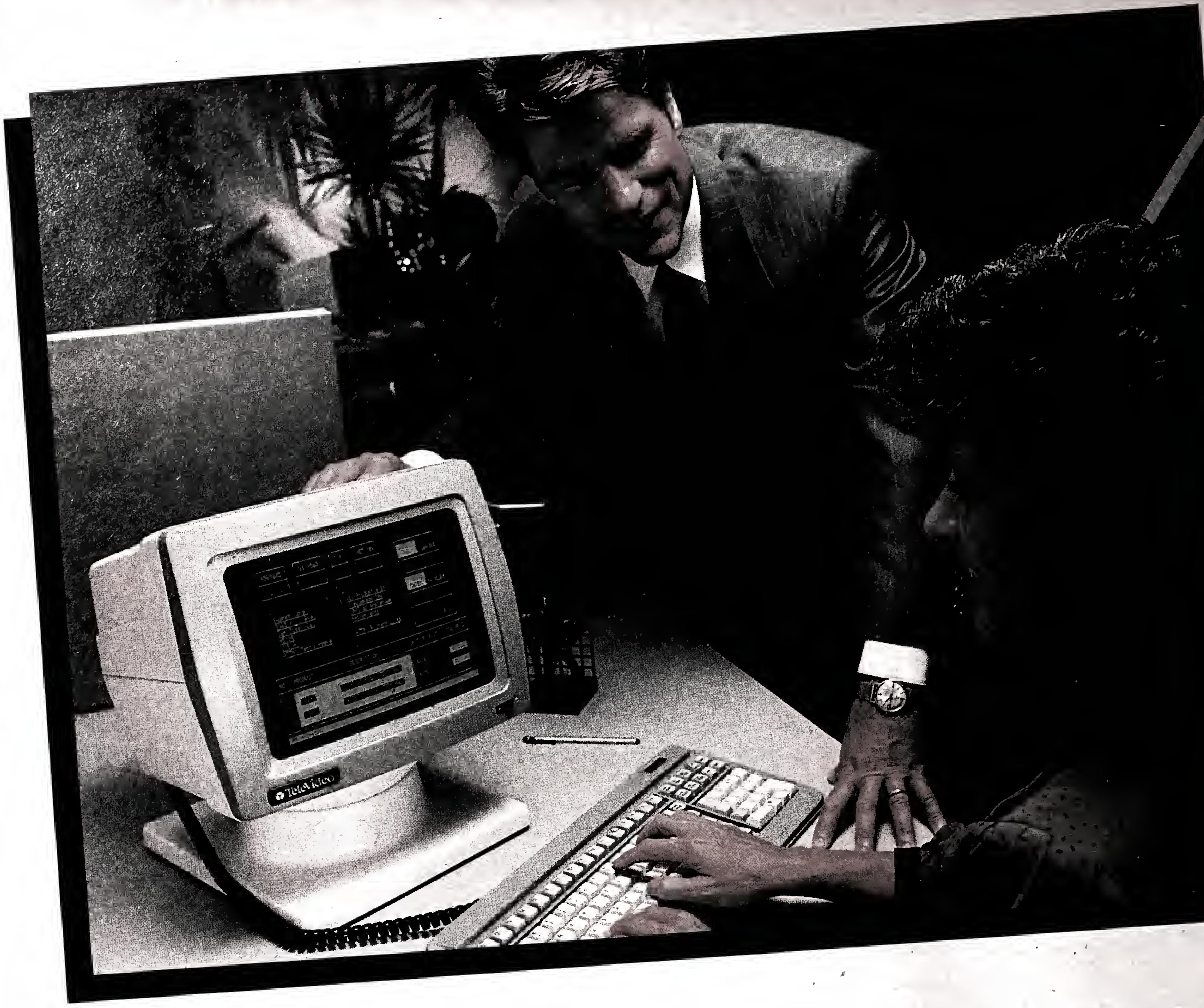
APPLICATIONS GENERATOR
Aura's integrated elements are only the beginning of its power. Because Aura also has an applications generator in its database module that takes it a quantum leap ahead of any other personal computer software.
Users can create and password protect their own menus. Or do several jobs in sequence at the touch of a key. And because Aura is completely menu-driven, your end users can do it themselves.

TOTAL SUPPORT SYSTEM
You'll have your own National Account Manager who is thoroughly familiar with mainframe environments. Comprehensive training courses and materials will be available, and applications specialists can help you integrate Aura into your company. Also, a fully-staffed, experienced team stands ready to answer your technical questions through Softrend's support hotline.

TOMORROW
Aura is only the beginning of what Softrend has planned for personal computers in large corporations. Because we're already at work on new ways to help you take even better advantage of personal computers.
For more information call (603) 898-1896, or write: Softrend, 2 Manor Parkway, Salem, NH 03079. And let your end users do it themselves.

double-density floppy disk drives.





THE NEW 924. THE TELEVIDEO SUCCESS STORY (contd.)

TeleVideo® has combined the best innovations in technology, design and quality of manufacturing to bring you superior terminals. Now with the new 924 we've built in comfort and productivity features that leave the other manufacturers behind.

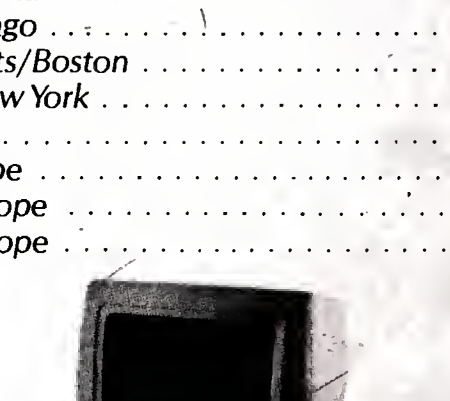
For user comfort, the 924 has a tilt and swivel non-glare screen and DIN-standard low profile keyboard. 16 programmable, non-volatile function keys (shiftable to 32) turn often used instructions into one key commands. Extra display features include full screen editing, character and block graphics, plus 32 non-embedded visual attributes. The 924's logical attributes define protected and unprotected regions for accurate data entry.

If you don't need the full power of the 924, our 914 has all the design advantages of the 924 at less cost.

Whatever your application, nothing measures up to TeleVideo. And nothing succeeds like the 924!

Call us at (800) 538-8725 for more information. (In California call (408) 745-7760) or contact your nearest TeleVideo office:

California/Santa Ana	*(714) 476-0244*
California/Sunnyvale	*(408) 745-7760*
Georgia/Atlanta	*(404) 447-1231*
Illinois/Chicago	*(312) 397-5400*
Massachusetts/Boston	*(617) 890-3282*
New York/New York	*(516) 496-4777*
Texas/Dallas	*(214) 258-6776*
Central Europe	*(31) 2503-35444*
Northern Europe	*(44) 9-905-6464*
Southern Europe	*(33) 1-686-4412*



TeleVideo® Terminals

TeleVideo Systems, Inc.

Service is available nationwide from General Electric Instrumentation and Computer Service Centers.

Data management tools cut oil firm's development time

MINNEAPOLIS — Productivity has been a growing concern of late in the DP profession. Dollars generated by productivity improvements fall right through to the bottom line and have an immediate positive impact on the enterprise.

Apache Corp., an independent oil and gas company located here, has made great strides over the past 18 months in enhancing its systems development activity. Results to date indicate a more than 25% reduction in the effort required to build systems. These results are a reflection of the application of data management and technical architecture software.

Apache is an oil and gas exploration and production company that creates, markets and manages oil- and gas-related investment products. Apache pioneered public drilling programs in the 1950s and, more recently, the Apache Petroleum Co., the first publicly traded limited partnership.

Significant growth rate

The growth of Apache's business has been significant over the past four years. For instance, the value of properties managed by Apache on behalf of investors has increased more than 250%, and the investor base that Apache serves has increased more than 290% in this four-year period. These factors translate into an equivalent growth in the information and data required to manage the business and a parallel growth surge in the investment of mechanized systems.

In August 1983, Apache embarked on a major systems development effort. When all the numbers were tallied, Apache was looking at a 30-man-year project. Facing such an effort and given that the system needed to be delivered in 1984, Apache began searching for methods and tools to reduce the development effort.

When the pot was fully percolated, Apache had installed the Cullinet Software, Inc. family of data management software products, installed a test management system, customized the data dictionary to support its systems development methodology and developed an array of standard reusable program code and common modules.

A project team of 25 people from Apache, Arthur Andersen & Co. and R. J. York & Associates used this collage of instruments to design and develop the new application — in less time, with less effort and (so far) within .5% of the estimated work days.

One of the major tasks in software development lies in testing. Thoroughly testing a system seems to consume a large part of the development effort. Apache decided to install a test management system developed by Arthur Andersen. With this software, Apache has been able to reduce the time spent in testing, particularly in the on-line area.

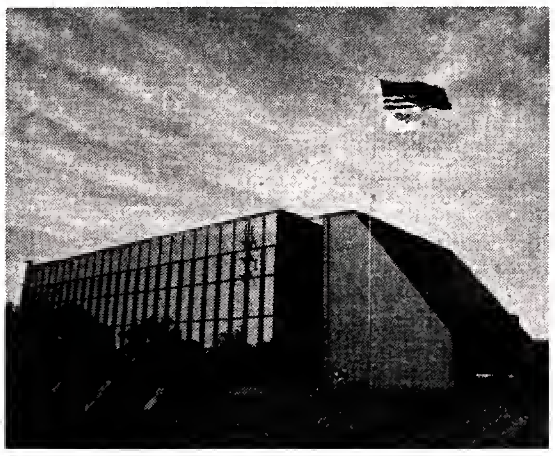
The test software is generalized and highly integrated with the Cullinet data dictionary, IDD, and its data base, IDMS. It consists of a set of screens that allow a programmer or analyst to create and maintain test data online. Each programmer has his own test data base, which can be manipulated, saved (up to a defined number of versions), restored, copied, printed and otherwise used. The system uses the data dictionary at execution time to determine the characteristics of the data base, so any changes to the data base are automatically reflected in the test management system. In addition, various utilities exist to reduce problems for the data base administrator. These utilities allow the data base administrator to modify data base object code, thereby eliminating numerous and time-consuming data base compiles.

For this project, Apache manages 15 unit test data bases, which are used by individual programmers and analysts, along with three system test data bases, used for integration testing, user testing and testing changes. With this environment, team members can test independently of each other, share test data, create test data online, print data bases and check test results with a formatted listing that displays data element names from the IDD. These facilities exist for

See **OIL** page 80

HOTSITE™ the dedicated IBM 4300 facility, gives you a disaster recovery back-up option that's five ways better.

It doesn't take much to put your computer out of business. But when it's backed up by HOTSITE, you'll be back in business - fast. Dedicated to disaster recovery, HOTSITE provides a far better option than an "empty shell," a reciprocal agreement or a duplicate site. It even has advantages over other dedicated facilities.



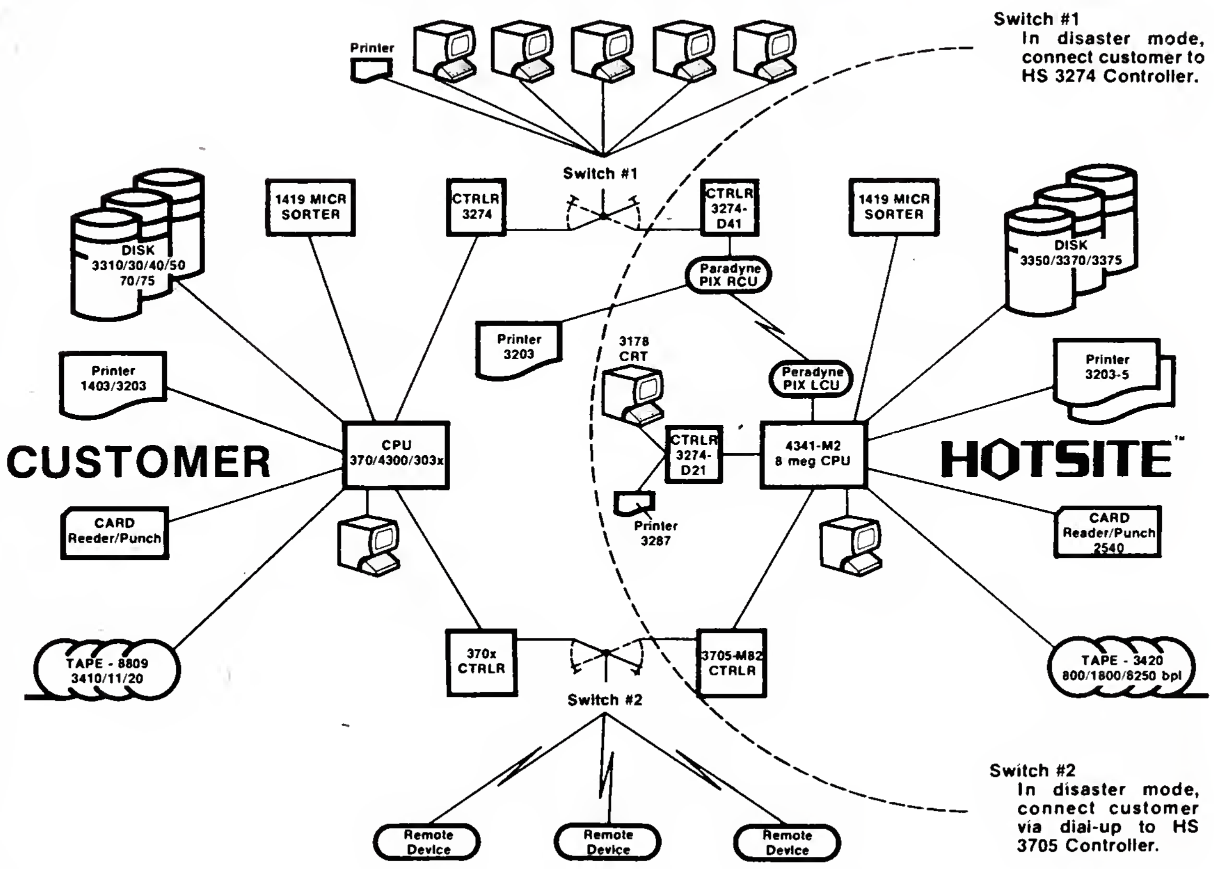
HOTSITE

- supports you with an IBM 4341-2 system and total communication equipment.
- insists that you test the system on a regular basis according to your needs.
- protects you with a state-of-the-art security system.
- assists you with comprehensive technical support.
- saves you money with flexible pricing.

You haven't explored your disaster recovery options until you've talked to our representative. Please use the attached coupon to contact us, or call (216) 652-9624.

HOTSITE™
A DIVISION OF RMI COMPANY
1000 Warren Avenue
Niles, OH 44446

THE HOTSITE BACK-UP SCHEME



Switch #1
In disaster mode, connect customer to HS 3274 Controller.

Switch #2
In disaster mode, connect customer via dial-up to HS 3705 Controller.

Complete and mail to: HOTSITE, 1000 Warren Avenue, Niles, OH 44446.

Yes, tell me more about HOTSITE, the fully-equipped IBM 4300 facility dedicated to disaster recovery!

☐ Please have a representative call. ☐ Please send a HOTSITE brochure.

Name ______ Title ______
Company ______
Address ______
City ______ State ______ Zip ______
Phone ______

OIL

from page 79

IDMS data bases as well as for Vsam flat files, and they have made a significant contribution to taking the bite out of testing.

The systems development process involves a significant amount of information that requires a great deal of time to manage, assimilate and record.

The extensibility features of IDD were employed to capture, maintain and report a wider spectrum of information than that which comes with the commercial offering. Apache enhanced the data dictionary to manage a majority of the documentation required by its systems development methodology, Method/1.

Apache's use of the data dictionary provided an on-line data base of documentation, accessible to all who need it. The data dictionary provides extensive cross-references, minimizes the inherent redundancy of systems documentation, improves documentation accuracy, helps minimize the impact of design changes and helps eliminate one of the most common complaints — illegible documentation.

Tracks system components

The data dictionary also assists in keeping track of all the system components (report screens, forms, job streams, conversations, programs, modules, records, files and messages), which has helped contribute to the accuracy of the implementation estimate. During the design of the application, Apache prototyped the on-line portion. This was done using Cullinet's ADS/On-Line and its mapping facility, OLM. All of the application screens were developed at that point, and small programs were coded to handle the flow between screens.

With the prototype, one could sit down at a terminal and play with the system as if it were complete. This enhanced the discussions with the business users regarding the deliverables and the operation of the system. It also provided a parts inventory, so to speak, for the on-line piece of the system. Through prototyping, Apache was able to get a solid technical design that helped confirm the completeness of the design, helped in preparing program specifications and served as an excellent jumping-off point for programming.

Inherent in computer-based systems is a great deal of redundant program code and duplicated functions. Apache decided, up front, to expand the effort required to define various program shells and common modules aimed at reducing the coding process. These shells and modules were prepared primarily for the on-line area, but there were some done for batch reporting.

For the on-line side, there were 10 standard program types defined (dialogs in the ADS/On-Line dialect). A shell program for each type was prepared by an experienced team member.

Common modules developed

In addition, various common modules were developed to perform universal functions such as data validation, error message handling and so forth. These modules are generalized, and whenever a program needs to perform one of the functions, all that is required is a call to the respective common module.

On the batch side of the house, the primary development aid was a Cobol-oriented reporting system. This included report program shells, again coded by a senior member of the team, which were modified as required to fit the unique requirements of a particular report.

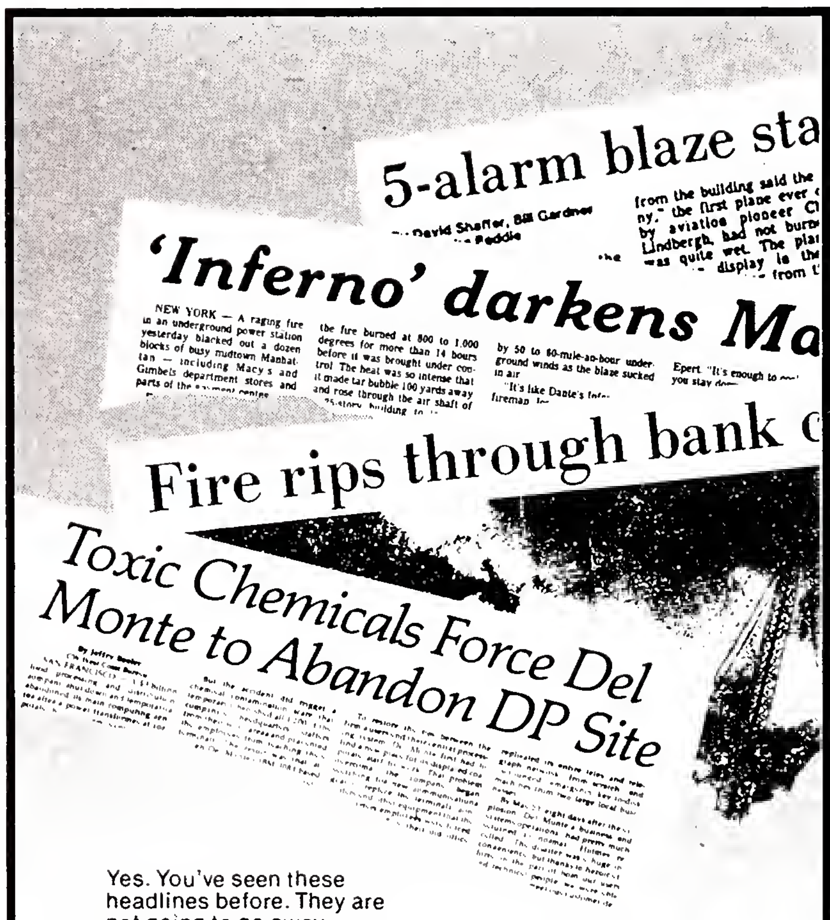
These report programs fit into an overall reporting architecture, which consists of an on-line report request conversation with a batch processor, extract programs that produce extract records for numerous reports and a report format driver that allows any number of format modules to be executed variably in a single run.

This reporting system served to reduce the effort required to produce application reports and standardized all batch reporting under a common architecture. In addition, a generalized audit trail reporting system was developed. This is integrated with the data dictionary and uses IDD information at runtime to format each report. With this architecture, the effort required to produce a new audit trail report is reduced to defining the audit trail record on the data dictionary.

During the design phase of the project and prior to the implementation, Apache began a conversion from DOS to MVS. The new system was to be developed under MVS, which opened the door for automating various functions through TSO/ISPF. A number of utilities with the testing software were provided by Arthur Andersen, and subsequent utilities were developed.

These utilities provide (through menus and fill-in-the-blank screens) the ability to edit source code, submit compiles, generate a formatted printout of a data base, copy shell programs, compare two data bases, initialize a data base, generate data dictionary reports, submit data dictionary input and execute a batch test. These on-line, menu-driven utilities lead the programmer through the coding process, which has helped to speed that process.

Apache has built a state-of-the-art business systems development environment. A host of tools and methods act in tandem to provide a mise-en-scene aimed at maximizing the efforts of all the actors involved in the systems development production. This development environment has bought the company a savings of more than 25% in the systems development activity.


5-alarm blaze sta
'Inferno' darkens Ma
Fire rips through bank c
Toxic Chemicals Force Del Monte to Abandon DP Site

Yes. You've seen these headlines before. They are not going to go away.

Just after you thought *I'm glad it wasn't me*, perhaps you asked yourself a very simple question.

*What if it **did** happen to me? Can I afford a data center disaster?*

We're LDI Disaster Recovery Corp. and we guarantee conditioned space, hardware, top level security, all ancillary services and software storage.

So your business can survive in the event your primary processing center is destroyed. We have several services that include hot site and/or shell availability.

The cost for top-drawer protection is less than the salary of one middle-level DP professional.

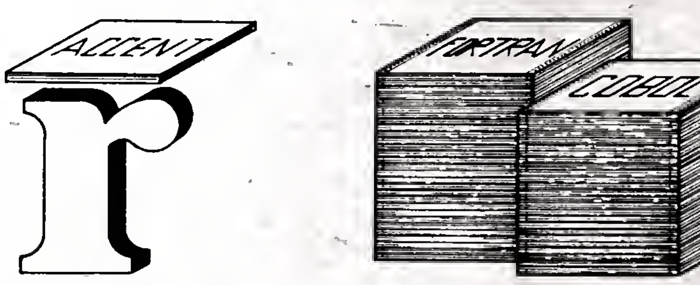
Many of our subscribers are now testing out their disaster plans on our multiple IBM computer systems in Solon, Ohio.

They're ready with a viable alternative to disaster... and possible business failure.

Are you? If not, call John Dosky today.

LDI
Disaster Recovery Corporation
30700 Carter Street • Solon, Ohio 44139 - Phone (216) 248-0991

ACCENT R CUTS CODE 80%!



More power for your DEC-10/20, VAX*

CUT CODE
ACCENT R can cut your code up to 80%. ACCENT R's 4th generation language incorporates a unique concept that models the various data processing components. These models result in 80% less code than required by FORTRAN or COBOL.

SAVE TIME
Less code means less programming and debugging time. But that's not the only way ACCENT R can save you time. ACCENT R's powerful non-procedural language provides a complete range of commands so end users can easily add, change and delete data items.

CUT COSTS
Naturally if you save time, you save money. Programmers produce more applications in less time. End users generate their own reports and put less demand on the data processing professionals. And both programmers and end users are happier. Satisfied employees means less turnover.

SAVE YOUR SANITY
If you are using a DEC 10 or 20 now but see a VAX in your future, rest easy. ACCENT R is migratable software. DEC 10/20 today, VAX tomorrow. A syntactically identical version makes migration easy; special pre-release pricing makes it affordable.

*VAX version available late 1984.

For more information send to: 20370 Town Ctr. Lane, #130, Cupertino, CA 95014
408/257-7700

Name __________
Company __________
Address __________
____
CPU __________ Phone __________

NATIONAL
INFORMATION
SYSTEMS, INC.

Businesses benefit from on-line transaction processing

Systems development architecture boosts programmer productivity

By J. Shirley Henry
Special to CW‡

The business benefits of on-line applications are well-known to the modern commercial enterprise. The overall productivity of a functional organization can often be improved by automating the function and allowing it to run on-line. Access to up-to-date information allows managers to make decisions in real time and helps support personnel to be more productive and creative. Aggressive use of on-line technology allows a business to use information as a competitive weapon in rapidly changing environments. Applications that synchronize an on-line data base with business events are called on-line transaction processing applications.

Historically, the implementation and maintenance costs of on-line transaction processing systems have limited their use to only the most highly leveraged applications. Most operating systems used to support on-line applications have their architectural roots in the batch processing concepts of the 1960s. They require the use of complex, arcane programming tools and the support of highly skilled and highly paid specialists. There is, however, an architecture for on-line systems development that substantially increases programmer productivity in on-line applications while reducing the need for specialized talent.

On-line transaction processing programs can be viewed as a collection of three basic entities: screens, which are used to capture and display data; programs, which manipulate data files and process information; and transitions between screens and programs.

In an order-entry system, screens are used to display the application menu, accept new customer data, accept order header information (that is, data that applies to the entire order), accept order line item data and display order status information. Programs are used to retrieve data from the customer file, build new customer records, retrieve and update inventory data, close out and store new orders, record back orders and create shipping documents. Transitions control the logic flow between programs and screens, based on processing states and operator actions.

The on-line systems development architecture improves programmer productivity by providing tools that allow these basic entities to be defined by the programmer and linked into operational applications.

This approach allows most of the application to be parameterized, rather than hand coded, in a fraction of the time required to write custom code.

The systems development architecture assumes a Unix undercarriage. The use of Unix eliminates much of the complexity inherent in on-line environments that use traditional mainframe operating systems. Unix is designed from the ground up for easy terminal support.

Standard Unix, however, does not contain all the functionality needed for commercial data processing. The architecture assumes a commercial Unix environment with the following extensions:

■ Keyed access support. The addition of keyed-access

See **UNIX** page 82

Henry is director of marketing for Tolerant Systems, Inc., a manufacturer of transaction processing computers based in San Jose, Calif.

A MINICOMPUTER NETWORK CAN INCREASE YOUR PRODUCTIVITY.

OR YOUR PHONE BILLS.

Most companies experience the same thing when they start tying remote terminals to their minicomputer.

Much higher phone bills.

But now there's an inexpensive solution to that costly problem: The new Codex 6002 Intelligent Network Processor.

This low-cost multiplexer will save you money even if you're using as few as two terminals. The 6002 boosts operating efficiency, reduces the number of needed lines and protects data from errors due to line disturbances. And it can handle any mix of up to 16 asychronous "terminals", including graphics terminals, word processors and personal computers from virtually any manufacturer.

Plus, only with the 6002 can you add asychronous equipment without worrying if your multiplexer is compatible or not. So not only will it save you money now, but also later as your network grows and grows.

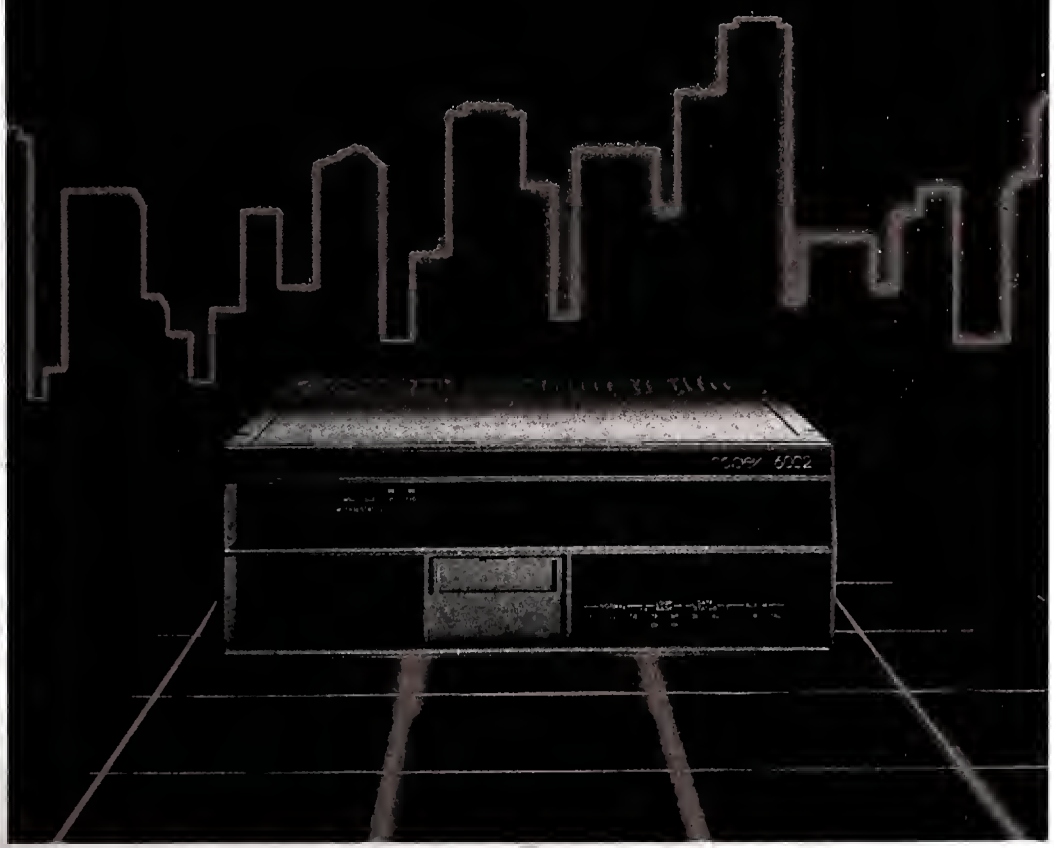
The Codex 6002 Intelligent Network Processor. It's just one of our many products that enable minicomputer users to develop and efficiently manage a growing network.

To learn more about the 6002, call 1-800-821-7700, ext. 892. Or write: Codex Corporation, Dept. 707-92, 20 Cabot Boulevard, Mansfield, MA 02048.

codex
MOTOROLA INC.
Information Systems Group

At NCC, see us at the Motorola Information Systems Group booth.

© 1984 Codex Corporation.



NEWS

UNIX

from page 81

support is required for Cobol.

- Extent-based disk allocation. Unix's block-oriented disk allocation approach is not appropriate to high-volume commercial file I/O.
- Integrated transaction support. BEGIN/END TRANSACTION constructs embedded in Unix simplify on-line programming and eliminate the need for programmer-developed recovery and restart procedures. Transaction support ensures that either the entire transaction is entered in the data base or the data files are returned to their pretransaction state automatically.
- A virtual terminal subsystem shields the application program from dependence upon or knowledge of the details of the terminal. It allows any program to run on any terminal without specialization of the application. Additional terminal types can be added to the operational environment without changing working programs.

This enhanced commercial Unix environment forms the foundation of the on-line development architecture.

The on-line development architecture consists of four basic components that provide the following functions:

- Forms creation utility. This program allows the programmer to define and modify screen formats. The formats include an image of the screen as seen by the application user and parameters that specify the validation edits to be applied to data as it is entered.
- Data manipulation programs. These programs accept edited data from a form, process it against information stored in the data base and send information to the appropriate form for display back to the user. Programs are also used to update data files or data bases.
- Transition tables. Once the screens and data manipulation programs have been defined, the application designer specifies the transition conditions that direct the application flow between various forms and programs.
- On-line application manager. This utility program processes the screen definitions, the source programs and the transition tables and generates a working application. The application program runs under control of an on-line application monitor that dynamically load-balances the system under changing work load conditions.

For an order entry program, the programmer would paint each screen using a forms creation utility. This process also specifies local data editing constraints to be applied to the data and video attributes to fields and assigns names to each field. The utility program also generates Cobol data structures for all data defined on the screen.

The programmer now defines a transition table for each screen. Next, the programmer codes data manipulation programs, using data templates created by the forms utility. In most situations, data descriptions of the files will come from Cobol copy libraries or from a data base dictionary. Data manipulation programs are short, single-function program modules that are easy to code. Each program is coded as a Cobol subprogram.

When all the data manipulation programs are complete, the on-line application manager is invoked to link the pieces together. If the designer so desires, the forms utility can be used to prototype a hypothetical application without writing the data manipulation programs. This allows the designer to arrive iteratively at an appropriate user interface without a lengthy design cycle.

It is estimated that this development approach increases programmer productivity in CICS-style mainframe environments by at least 25:1 (that is, a 25-day CICS programming task takes one day using these tools). In terminal-oriented minicomputer environments, the improvement is expected to be at least 10:1. Of equal importance, however, is the fact that on-line application development is simple enough to be accomplished by nonspecialist programmers. It is easier to build on-line applications with this tool kit than to build batch applications using conventional programming techniques. The methodology goes a long way toward eliminating the cost barriers to on-line application development.

How do you sell power? You don't. Power sells itself. That's why you need to know about CDI/100, the powerful information management system.

Suddenly your customer, whether novice or sophisticate, has the power to control and focus the computer, to get it to do what it was meant to. And the dynamic menu system makes it all so easy.

Our relational data base management system features variable length fields as well as a unique, open-ended file structure. The result is tailored formatting with virtually limitless record keeping and information management capability.

And CDI/100 allows the operator to use a host of existing application programs, maximizing the computer's efficiency and

Application generators: They just get no respect

By Bernard A. Hodson
Special to CW‡

A recent article in *Computerworld* mentioned that a software house had decided to withdraw an application generator from the market after placing it in beta test mode. There were two main reasons given for this decision.

First, due to technical functionality, the vendor wanted to go back and do some more homework. The second reason was more interesting and thought-provoking. The vendor decided to withdraw the product when he found that its market was not the user, as expected, but the programmer, who was much more demanding of technical functionality.

This is just one of the dilemmas facing writers of such generators. To whom do you market them, and in fact, do you market them at all? This latter statement may seem a peculiar one to make; yet it is a real concern. The real market is in applications that do useful work for the end user. The main reason for the success of products such as Sorcim Corp.'s Supercalc and Micropro International Corp.'s Wordstar is that they address a user need.

An application generator is like a goose that lays golden eggs. Do you sell the eggs or the goose? If you sell the eggs, you are competing in a market that is saturated with applications.

Admittedly, many of them are junk, but there are some good products on the market. To compete requires a considerable investment. On the other hand, if you sell the goose, the market becomes smaller and you then provide a tool for others to develop applications very quickly. Your users will reap most of the benefits, except for any royalties that are negotiated.

Application generators are very compact. Wordstar, on a microcomputer, takes up to 64K bytes. The equivalent, with an application generator, takes about 1K byte. With an application generator, a Wang word processor will take about 6K bytes, and Ashton-Tate's Dbase II will take about 2.5K bytes.

The same system that generates these applications also runs them. The runtimes are in most cases as fast or faster than those of the product on the market and can be made with fewer restrictions. Therefore, the above examples can come simultaneously in 42K bytes of memory, including the generator, and can still have room for extra applications.

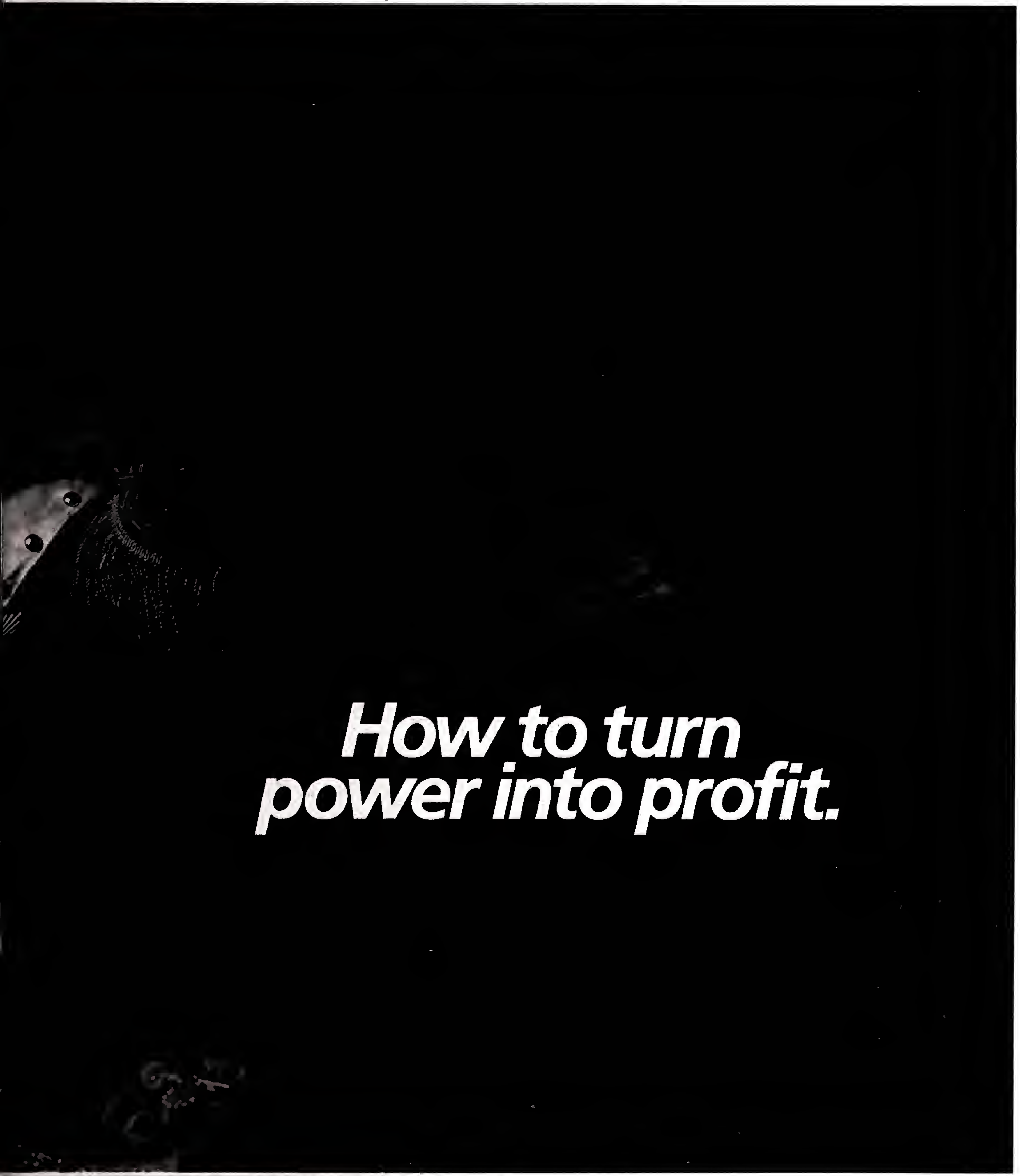
There is an additional dilemma, that of credibility. No one believes in application generators' capability, particularly programmers. We are so steeped in concepts of programming, concepts that originated in the 1950s, that the marketing of the application generator has a major problem of credibility.

There is another dilemma, which does not really concern those who develop such systems, but which does concern those who make computers. The manufacturers have to ask seriously, "Are these generators for real?"

Since they are, then the implications for the industry are enormous. They do not need a large memory, except to run multiple copies of the generator/processor and to increase the buffer sizes to improve throughput. For the applications that are well suited to such generators, there is no need for huge operating systems that can simultaneously run code generated by conventional compilers.

And last, but by no means least, the generators can be placed on a chip, so that manufacturers can continue to offer their customers the joys and heartaches of either Basic or Cobol.

Hodson is a consultant and developer of application generators and is based in Ottawa.



effectiveness.

Try CDI/100 for yourself. If you haven't received one of our free trade kits, call 1-800-426-8931 today. Go ahead, put CDI/100 through *your* paces. We think you'll be pretty enthusiastic. And enthusiasm, like power, sells itself.

Exceptional New Software Concept
- Everyone's Filing System
- English-like Inquiry Language
- Dynamic Menu System
- Integrated Help Features
- Relational Data Management
- Enhanced Basic Compiler
- Dictionary Supported Data Base
- Task Master

CDI 100™

CDI Information Systems, Inc.
1309 114th Ave. S.E.
Bellevue, WA 98004
(206) 455-5117

INCREASE YOUR PERSONAL POWER.™

CALL FOR PAPERS

1984 CAUSE NATIONAL CONFERENCE

Kissimmee, Fla., Dec. 4-7

Papers are being solicited in the following areas: issues in higher education, managing the information resource, innovative technologies, office automation/networking, microcomputer issues and applications, promises and perils of technology and great applications.

The deadline for abstracts is July 13. They should be sent to Cause, 737 29th St., Boulder, Colo. 80303.

1985 RESEARCH CONFERENCE

Atlanta, Feb. 2-3

The Office Systems Research Association (Osra) has issued a call for papers on the following suggested topics, but topics will not be limited to these: planning and conducting effective research projects, data gathering and analysis techniques, office automation case studies, office automation overviews, behavioral and psychological implications of office automation, environmental factors in the automated office, the impact of the microcomputer on office systems, career opportunities in OA, collegiate education for the automated office and white-collar productivity.

Interested parties may submit a full paper or a 500-word synopsis with a detailed outline of the proposed presentation. Papers and proposals should be submitted by Aug. 15 to Mary M. Ruprecht, Osra Conference Chairwoman, 140 W. Myrtle St., Duluth, Minn. 55811.

1985 FEDERAL OFFICE SYSTEMS EXPO (FOSE '85)

Washington, D.C., March 4-7

Fose '85 is soliciting presenters of sessions in the following areas: impact of office systems on organizational performance, systems integration, networking, telecommunications, teleconferencing, data base management, decision support systems, microcomputers, personal computers, software, strategic planning, word processing, data processing, computer graphics, information storage and retrieval, computer-based training and systems/office design. Proposals must include an audience profile, a description of content areas to be covered, a description of presentation method, a statement of audiovisuals to be used (Fose requires that speakers use effective visuals) a biography of the principal speaker and names of copresenters.

All papers must be submitted by July 1. Papers, proposals and inquiries may be sent to Linda Maldonado, Director of Program Development, National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22320.

1985 NATIONAL COMPUTER CONFERENCE (NCC '85)

Chicago, July 15-18

NCC '85 is sponsored by the American Federation of Information Processing Societies, Inc. (Afips), the Association for Computing Machinery, the Data Processing Management Association, the Institute of Electrical and Electronics Engineers Computer Society and the Society for Computer Simulation.

Information processing professionals are invited to participate by writing a paper or organizing and leading a session. The deadline for submission of papers is Oct. 30, and deadline for final session proposals is Aug. 31. A preliminary proposal (title, abstract, target audience) is required and must be approved before final proposals will be accepted.

Submissions, proposals, correspondence and inquiries should be sent to Anthony S. Wojcik, NCC '85 Program Chairman, Department of Computer Science, Illinois Institute of Technology, 3300 S. Federal, Chicago, Ill. 60616.

Seta conference set for November

ORLANDO, Fla. — Robert Wiggins, president of Paradyne Corp., will deliver the keynote address at the Southeastern Telecommunications Association's (Seta) 1984 Annual Conference, which will be held at the Hyatt Hotel here Nov. 5-7.

Seta is a nonprofit professional organization that is devoted to the enhancement and development of telecommunications management, a spokesman said.

The three-day conference has as its theme "Balancing Technology and Management," and it will feature a variety of exhibitions focusing on the latest in telecommunications equipment and services, according to the Seta spokesman.

Among the topics scheduled for discussion during the conference sessions are cellular radio, bypass technologies, microcomputer use, telecommunications careers, training, teleconferencing, the impact of the AT&T divestiture, network enhancements and current and future directions in the telecommunications industry.

The registration fee for Seta's 1984 annual conference is $230 per attendee.

Additional information is available from Seta, which can be contacted through P.O. Box 901, Richmond, Va. 23207.

Gould...Innovation and Quality in UNIX-based Systems.

The Firebreathers from Gould blast the competition into oblivion.

*UNIX is a trademark of AT&T Bell Laboratories
™PowerNode and PowerSeries
are trademarks of Gould Inc.
™VAX is a trademark of Digital Equipment Corp.

CALENDAR

WEEK OF JULY 29

AUGUST 1-2, RICHARDSON, TEXAS — **Dbase II.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held August 6-7 in Denver; August 8-9 in Phoenix; August 13-14 in Raleigh, N.C.; August 15-16 in Chicago; August 20-21 in Springfield, Ill.; and August 22-23 in Gary, Ind., and Dayton, Ohio.

AUGUST 1-3, ANCHORAGE, ALASKA — **Office Automation and the Technology Revolution.** Contact: Data-Tech Institute, P.O. Box 569, 386 Franklin Ave., Nutley, N.J. 07110. Also being held August 8-10 in Rochester, N.Y.; August 15-17 in Portland, Ore.; August 22-24 in Hartford, Conn.; and August 27-29 in Princeton, N.J.

AUGUST 1-3, BALTIMORE — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held August 15-17 in Chicago and August 22-24 in Newport Beach, Calif.

AUGUST 1-3, MINNEAPOLIS — **DOS/VSE Internals Debugging and Problem Determination.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

AUGUST 1-3, INDIANAPOLIS — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held August 8-10 in Scottsdale, Ariz.; August 15-17 in Huntsville, Ala.; and August 22-24 in White Plains, N.Y.

AUGUST 1-3, COLUMBUS, OHIO — **Networking & Data Communications for Personal Computers.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held August 15-17 in San Francisco and August 20-22 in St. Louis.

AUGUST 1-3, HARTFORD, CONN. — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held August 15-17 in Honolulu and August 22-24 in Portland, Ore.

AUGUST 1-3, TORONTO — **Personal Computers.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held August 6-8 in Montreal and Albany, N.Y.; August 13-15 in Indianapolis; August 15-17 in Calgary, Alta.; August 20-22 in Seattle; and August 22-24 in Cherry Hill, N.J.

AUGUST 2-6, OSAKA, JAPAN — **Autofact Japan 1984.** Contact: Computer and Automated Systems Association of Society of Manufacturing Engineers (SME), P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

WEEK OF AUG. 5

AUGUST 5-8, KANSAS CITY, MO. — **The 16th Annual Meeting of the National Association for State Information Systems (Nasis).** Contact: Nasis, P.O. Box 11910, Lexington, Ky. 40578.

AUGUST 6-7, CHICAGO — **Micro/Personal Computers: State of the Art.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

AUGUST 6-8, WASHINGTON, D.C. — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

AUGUST 6-9, NEW YORK — **TSO ISPF.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

AUGUST 6-10, SUNNYVALE, CALIF. — **System Resource Planning and Selection.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

AUGUST 6-10, ATLANTA — **MVS Systems Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

AUGUST 6-10, AUSTIN, TEXAS — **The National American Association for Artificial Intelligence (AAAI) Conference.** Contact: AAAI, 445 Burgess Drive, Menlo Park, Calif. 94025.

AUGUST 6-10, NEW YORK — **CICS Command-Level Programming.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held August 24-28 in Chicago.

AUGUST 6-10, NEW YORK — **Project Planning and Control Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

AUGUST 6-10, CHICAGO — **Structured Analysis and Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held August 6-10 in Salt Lake City; August 13-17 in New York, New Orleans and Washington, D.C.; and August 20-24 in Pittsburgh.

AUGUST 6-10, MINNEAPOLIS — **Structured Analysis and System Specification Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held August 20-24 in Atlanta and August 27-31 in Los Angeles.

AUGUST 6-10, PALO ALTO, CALIF. — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

AUGUST 6-10, WASHINGTON,

See **AUGUST** page 86

With blazing performance.
Great leaps in raw performance are rare in the computer world. Usually, changes occur in increments of half-a-MIP or so. Now real Firebreathers roar into the arena, quadrupling the best the competition has to offer.

With scorching speed.
These creatures don't run a little faster. Running real production code supplied by VAX™ users, our PowerNode™ 9000 benchmarks at 4.5 times faster than the VAX 11/780...at a comparable price! Even our second-in-line PowerNode 6000 runs 1.5 times faster. But with all this power and speed, the PN6000 has a dainty footprint ...60% less than the VAX 11/780.

With sizzling simplicity.
Even the hottest firebreather won't fly if it's hard to run. Ours are UNIX*-based, so ease of use and compatibility become part of the power. Plus we offer the "Compatibility Suite", application software packages which are consistent across our entire Gould PowerSeries™ product line...the widest range of UNIX-based systems in the world.

More than a myth.
We know these claims sound outrageous. Make us prove them. Give us your benchmarks and production code. We'll show you numbers that surpass all expectations. Call 305-797-5459 for a test flight on the Firebreathers. Mainframe performance disguised as a supermini. The scorching performance you expect from Gould.

Gould Inc.,
Computer Systems Division
Distributed Systems Operation
6901 West Sunrise Boulevard
Ft. Lauderdale, FL 33313

GOULD
Electronics

AUGUST

from page 85

D.C. — **Computer Capacity Planning for Sperry 1100 Systems.** Contact: Compumetrics Training Institute, P.O. Box 3015, Commerce, Texas 75428.

AUGUST 8-10, BOSTON — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held August 15-17 in Columbus, Ohio, and August 22-24 in Atlanta.

AUGUST 8-10, ATLANTA — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 9-10, WASHINGTON, D.C. — **Data Administration: Development and Practice.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

AUGUST 11-12, NEW YORK — **Vsam.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

WEEK OF AUG. 12

AUGUST 13-14, NEW YORK — **Computer System Security Management.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

AUGUST 13-14, BOSTON — **X.25 and Other Protocols.** Contact: Ruby Hegarty, Honeywell Education Services, P.O. Box 8000, MS/T99, Phoenix, Ariz. 85066.

AUGUST 13-16, DALLAS — **CICS Application Design.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

AUGUST 13-17, HOUSTON — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

AUGUST 13-17, LOS ANGELES — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held August 20-24 in Washington, D.C., and August 27-31 in Dallas.

AUGUST 13-17, SAN FRANCISCO — **Structured Systems Analysis & Design.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

AUGUST 13-17, HOUSTON — **Project Planning and Control Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

AUGUST 13-17, OAKBROOK, ILL. — **Capacity Planning and Modeling.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

AUGUST 13-17, CHICAGO — **Structured Design for Real-Time Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held August 20-24 in Seattle and August 27-31 in Phoenix.

AUGUST 14-15, NEW YORK — **Telecommunications.** Contact: The Yankee Group, 89 Broad St., Boston, Mass. 02110. Also being held August 21-22 in San Francisco.

AUGUST 14-16, BOSTON — **Data Base Administration and Data Resource Development.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

AUGUST 15-16, WASHINGTON, D.C. — **Computer System Security Management.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92706.

AUGUST 15-24, BOSTON — **Analysis and Design of Distributed Networks — Part II.** Contact: Ruby Hegarty, Honeywell Education Services, P.O. Box 8000, MS/T99, Phoenix, Ariz. 85066.

AUGUST 17-21, NEW YORK — **CICS Internal Architecture.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

WEEK OF AUG. 19

AUGUST 19-23, SAN FRANCISCO — **The Third Annual Computers/Graphics in the Building Process Conference and Exhibitiion (BP '84).** Contact: BP '84, Suite 333, 2033 M St. N.W., Washington, D.C. 20036.

AUGUST 20-24, HOUSTON — **Structured Analysis & Design Techniques.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

AUGUST 20-24, CHICAGO — **Advanced Structured Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held August 27-31 in San Francisco.

AUGUST 20-24, ENGLEWOOD CLIFFS, N.J. — **Network Performance Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

AUGUST 20-24, NEW YORK — **Vsam.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

AUGUST 20-24, CHICAGO — **IMS Data Base Design.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

AUGUST 21-23, MT. POCONO, PA. — **Strategy of Formulations Development.** Contact: Du Pont Statistical Seminars, Room X-40236, Wilmington, Del. 19898.

AUGUST 22-24, BOSTON — **Relational Data Bases.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held August 27-29 in Toronto.

AUGUST 22-24, LOS ANGELES — **VM/SP Structure, Flow & Tuning.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

"We can eliminate your data entry problems... I guarantee it!"

Robert L. Ableman
President, International Software Technology, Inc.

Now you can drastically cut your data center costs and dramatically improve your efficiency!

International Software Technology introduces ODE, a major breakthrough in on-line data entry software. It's by far the most advanced product on the market today.

ODE's low resource requirements (only 40-K resident storage), full menu drive, and "Subsecond Response" time are unequaled by any other product in the data entry arena. And ODE makes it easy for you to distribute some or all of your data entry to the departments actually responsible for creating the source documents. End users (with no computer training) can learn to enter, verify and correct data in no more than a few hours.

I unconditionally guarantee you will get more data entered faster at lower cost and with greater accuracy, using ODE! If not completely satisfied, you can return it for a full refund for up to three months after purchasing or leasing.

ON-LINE DATA ENTRY™ SM
ode

FREE 30 DAY TRIAL
Compare ODE side-by-side with your present system and see what a dramatic difference it makes! Absolutely no cost or obligation. Call or write today for more information.

Call TOLL-FREE
1-800-633-4748

International™ SM Software Technology, Inc.
2022 Powers Ferry Road • Suite 240 • Atlanta, GA 30339-9990

International™ SM Software Technology, Inc.
2022 Powers Ferry Road • Suite 240 • Atlanta, GA 30339-9990

☐ Please rush me additional information about ODE on-line data entry software.

Name________
Title________
Company________
Address________
City________State______Zip______
Phone (____)________

010

For multi-user on-line systems, your customers demand 32-bit price/performance, UNIX, and data integrity. Make the right move.

One move can give you a sizable advantage in your markets. And, it's available now from Tolerant Systems—the Eternity Series™ on-line transaction processing system.

Eternity's 32-bit supermini performance gives you a strategic edge over your competition, while its supermicro price lets you expand your markets and increase your margins.

And, its UNIX™-compatible operating system gives you integrated transaction management, enhanced file management, application portability, and data integrity.

Without data integrity, your on-line solutions risk bottom-line problems. With Eternity's data integrity, not even a failure in mid-transaction can corrupt or destroy your customer's data. And, the transaction restarts immediately upon system restoration—with current, accurate data.

Eternity's advanced system software also features powerful application generation tools for increasing your developers' productivity and accelerating your time to market. These tools include a screen-based forms manager, a relational DBMS with end-user access, and an application system manager.

So, if your markets demand high-performance transaction processing and UNIX with data integrity, make the right move. The Eternity Series is available now.

Learn more about Eternity by contacting Shirley Henry, Director of Marketing, Tolerant Systems, Inc., 81 East Daggett Drive, San Jose, CA 95134, (408) 946-5667, TELEX 278860.

Tolerant
systems

The Right Move.

The Eternity Series from Tolerant Systems is designed to operate in Class II office environments.
UNIX™ is a trademark of Bell Laboratories.
Eternity Series™ is a trademark of Tolerant Systems, Inc.

EDITORIAL

Untangling Big Blue's cable

We discovered some interesting items recently while attempting to dissect the vaunted IBM cabling announcement, the most notable item being the difficulty in finding users who, weeks after the announcement, know what the heck it is.

It seems there was a lot more confusion generated within the user community regarding the Cabling System than anything else. Clearly someone — either IBM or the trade press or inhouse technical support personnel or some combination thereof — was not doing his job very well. Or, given the rather unusual nature of the announcement, it was simply difficult to decipher just what IBM was up to.

At least now we know this much: No, the Cabling System is not a local-area network. Unlike a local net, it doesn't provide access to multiple resources, nor does it provide for the sharing of wire media.

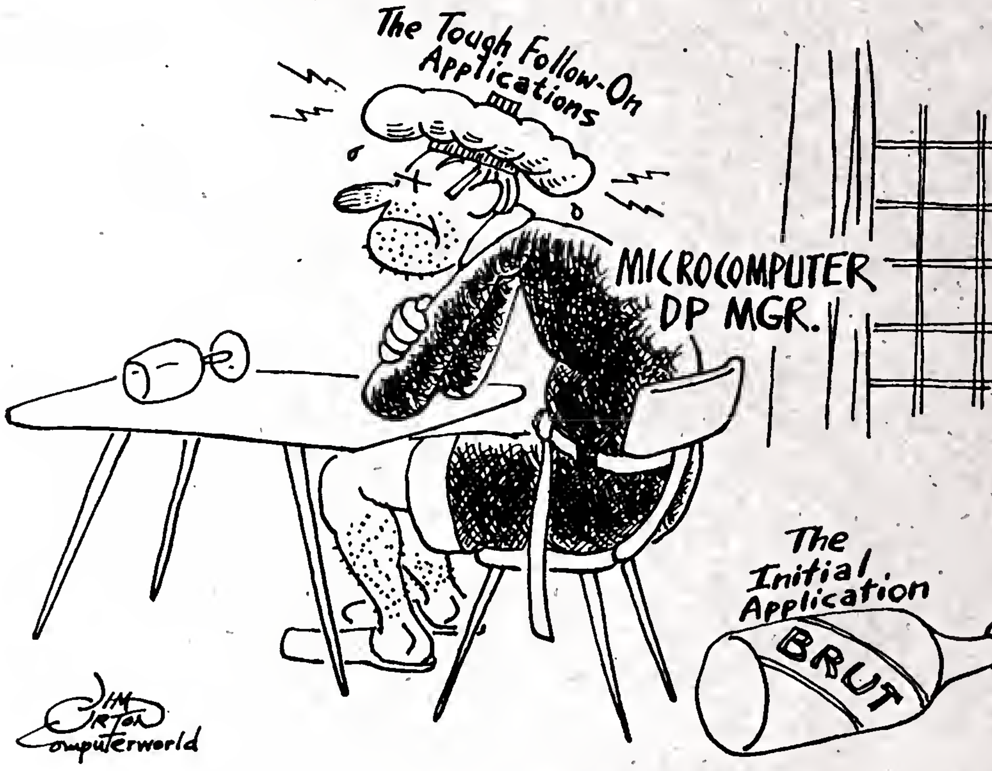
This point, the fact that it is not a local-area network, would be an insignificant one had anyone but IBM made the non-local-area-net announcement. Instead, IBM told the world there would be another two-year wait for a Big Blue local-area network, an announcement that did not go over particularly well with the many industry pundits who, six months ago, were practically insisting IBM cast its entry onto the local-net waters early this year. And what a lambasting IBM took for not doing, according to these pundits, what it was supposed to do!

But the most interesting aspect of the cabling announcement was not what it means (or doesn't mean) to users, but rather what it means to other vendors of local-area networking products. Because users will apparently get nothing from IBM in the way of a local-area network for some time, other local-area net vendors are envisioning a world of symbiotic bliss.

That world features IBM running its cable throughout every new and extensively rehabilitated commercial high rise for at least the next two years, while the vendors reconfigure their local-area network offerings for attachment to the cabling scheme. As one vendor told *Computerworld*, IBM's cabling scheme is the most important announcement in the history of local-area networks — and it's anything but a local net.

To be sure, IBM has other designs. Most likely, it will begin wiring buildings, as it already has [CW, June 4], and then begin dropping bits and pieces of a true local-area network onto the commercial market — *its* local-area network. It just may be a mistake to think it a simple matter to beat IBM at its own game. As one of the companies that will install the Cabling System pointed out, the relatively high per-office wiring cost of the Cabling System stems from the company's insistence on using nonstandard components like wiring, connectors and distribution panels. That is, the user has to shop with IBM for every element, if he wants the cabling scheme at all.

There's a better than even chance that IBM is intending to sell a lot more than just cabling components.



The morning after.

LETTER

Misleading attributions

Richard L. Conner quotes me in a number of places in the In Depth article, "Cobol, your age is showing" [CW, May 14]. Since I am the only person quoted at all, the reader might reasonably conclude that I had some involvement with the preparation of this article, and/or that I was in agreement with the views Conner expressed.

From a purely personal viewpoint, I disagree completely with the spirit of the article and never saw any portion of it until its publication.

One of the statements attributed to me is misleading and out of context. I did not say that "the committee refused to incorporate good ideas that it recognized in Commercial Translator because it didn't want to create the appearance that IBM had dominated the discussions."

There are two printed relevant statements that I did make on this point, and both appear in my paper "The Early History of Cobol" in *History of Programming Languages*, R. L. Wexelblat, Editor, Academic Press. I said, "As best I can recall my view at that time, I felt there was a strong anti-IBM bias in this committee from me and some (but certainly not all) of the others. Since I was not working for IBM at the time, I can freely (although not with pride) admit that in some cases suggestions or decisions were made on the basis of doing something differently than IBM did it."

However, on later pages, I cited six major contributions of Commercial Translator to Cobol. These include formula expressions, conditional variables, many levels in data design, the IF-THEN clause, suffixing and the PICTURE clause. It is clear from the cited paper that IBM's Commercial Translator and Sperry Corp.'s Flowmatic were the two major intellectual inputs to Cobol.

The list just given indicates that significant ideas from Commercial Translator were included, and they played a major role in the Cobol specifications of 1960.

Jean E. Sammet
Chevy Chase, Md.

COMPUTERWORLD

Editor
John C. Whitmarsh

Executive Editor
Rita Shoor

Managing Editor
Bill Laberis

Assistant Managing Editor
Cheryl M. Gelb

Senior Editors:
Software
Paul Gillin
Communications
John Dix
Phil Hirsch
Systems
Tom Henkel
Microcomputers
Eric Bender
Industry
Peter Bartolik
Features
George Harrar
Design Editor
Marjorie Magowan
International Editor
Susan Blakeney
Associate Features Editor
Barbara Van Scoyoc
Assistant Features Editor
Elizabeth Morse
Special Reports Editor
Donovan White

Senior Writer
John Gallant
Staff Writers:
James Connolly
John Desmond
Paul Korzeniowski
David Olmos
Edward Warner
Correspondents:
New York
David Myers
Suite 7G
401 East 80th St.
New York, N.Y. 10021
212/570-2135
Washington, D.C.
Bureau Chief: Jake Kirchner
Senior Correspondent:
Bryan Wilkins
445 National Press
Building
529 14th St., N.W.,
Washington, D.C. 20045
202/347-6718

West Coast
Bureau Chief: Jeffry Beeler
Correspondent: Robert Batt
1060 Marsh Rd.
Menlo Park, Calif. 94025
415/328-8064
Chief Copy Editor
Kathie Gow
Assistant Chief Copy Editor
Charlotte Ziems
Copy Editors:
Becky Batcha
Dave Bouffard
Bruce Crane
Deborah Fickling
Penny Janzen
Lory Zottola
Assistant to the Editor
June Fettig
Editorial Assistants:
Lorraine Brien
Mary DeCristoforo

Contributors
Education
J. Daniel Couger
Human Connection
Jack Stone
Turnaround Time
Larry Long
Microcomputers
Thomas Madron
The Data Center
John P. Murray
Lecht on Science
Charles P. Lecht

Special Publications
Computerworld Extra!
George Harrar, Editor
Computerworld on Communications
Bruce Hoard, Editor
Computerworld OA
Ann Dooley, Editor
Computerworld Buyer's Guides
Marcia Blumenthal, Editor

Main Editorial Office: Box 880, 375 Cochituate Road, Framingham, MA 01701 617/879-0700

Computerworld is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 53 computer publications in 19 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *Computerworld/Argentina;* Asia's *The Asian Computerworld;* Australia's *Computerworld Australia, Australian Micro Computerworld, Australian PC World and Directories;* Brazil's *DataNews* and *MicroMundo;* China's *China Computerworld;* Denmark's *Computerworld Danmark* and *MicroVerden;* Finland's *Mikro;* France's *Le Monde Informatique, Golden* (Apple) and *OPC* (IBM); Germany's *Computerwoche, Microcomputerwelt, PC Welt, Software Markt, CW Edition/Seminar, Computer Business* and *Commodore Magazine;* Italy's *Computerworld Italia;* Japan's *Computerworld Japan* and *Perso ComWorld;* Mexico's *Computerworld Mexico* and *CompuMundo;* Netherland's *Computerworld Benelux* and *Micro/Info;* Norway's *Computerworld Norge* and *MikroData;* Saudi Arabia's *Saudi Computerworld;* Spain's *Computerworld Espana* and *Micro Sistemas;* Sweden's *ComputerSweden, Mikro Datorn, Min Hemdator and Svenska PC World;* the UK's *Computer Management* and *Computer Business Europe;* the U.S.' *Computerworld, HOT CoCo, inCider, InfoWorld, jr., MacWorld, MICRO MARKETWORLD, Microcomputing, PC World, PC Jr. World, Run, 73 Magazine* and *80 Micro.*

VIEWPOINT

Guidelines to selecting and installing your DBMS

THE DATA CENTER
John P. Murray

This is the third in an eight-part series.

Several years ago I would have espoused a somewhat cavalier approach to the subject of the selection and installation of a data base management system (DBMS). I probably would have recommended: "Obtain the best DBMS you can find, install it and move ahead. Do as much planning as possible, but the salient factor must be to make progress. The key is to get going. The details will take care of themselves."

I still endorse such a stance, particularly as opposed to doing nothing, although somewhat more reluctantly than several years ago. Now I favor a more reasoned, more cautious approach. Such an approach would be couched, however, if it reached the point of studying the issue to death.

This change of mind is not the result of any difficult personal experience. While we have moved rapidly and aggressively with our DBMS, we did carry on a considerable amount of preliminary investigation and planning. Several advantages have allowed us to avoid many of the potential DBMS pitfalls: We have a very good DBMS, and more importantly, we have a very good staff. With these two important factors going for you, a number of MIS management mistakes can be covered and still look good.

Now, several years later, I better understand the magnitude of the DBMS effort. Because I more fully appreciate the DBMS potential for disaster as well as for success, I would tend to temper my advice about the support of a cavalier approach to its installation.

Mandatory items for DBMS success

After giving the matter considerable thought, I would suggest the following items as being mandatory for the achievement of a successful DBMS endeavor:

■ The support of the organization's senior management for the project must be secured. This will require a sales and marketing effort. Time and attention must be paid to this process, and it must be viewed as a continuing effort. The sale of the DBMS to the organization's senior management must be on a business basis, as opposed to a technical one.

■ The DBMS endeavor must have a champion. That champion, at least logically, should be the organization's highest ranking MIS person. Unless that person really believes in the DBMS and is willing to provide total support and the determination to see the effort through, ultimate success is unlikely.

■ The selection and development of a strong MIS staff. This is not limited to the DBMS group within the MIS department, but to the entire MIS staff. At first, the DBMS effort will be restricted to those with specific MIS responsibilities, but, if the true potential of the DBMS is to be realized, the entire MIS group must understand and support the effort.

■ Communication, particularly within MIS, is of critical importance. The entire MIS staff must be kept aware of the DBMS planning and must be provided with a comprehensive understanding of the direction and goals of the DBMS effort. It is likely that to some degree — as the DBMS process evolves and the technology of the particular DBMS improves — the specific DBMS goals may be altered.

The concern here should be with the need to communicate the overall goals and subsequent changes, if any, to the MIS staff. In addition, the intent should be to offer MIS staff members the opportunity to participate in the DBMS effort through the solicitation of ideas and the consideration of differing points of view.

Of course, the final decisions must be made by MIS management, but encouraging open communication within the MIS department can help mitigate at least some of the trauma produced by the aggressive pursuit of a truly effective DBMS.

■ The DBMS marketing effort directed toward the organization's senior staff and the MIS clients must not be allowed to get out of hand. The quite understandable enthusiasm for the DBMS project and its benefits should not place MIS in a position where its reach exceeds its group.

The potential benefits of a DBMS are many, but these benefits must be tempered with money, hard work, frustration and delay that may be encountered.

■ A general direction and a somewhat more specific, yet flexible, plan for DBMS progress must be installed. Both the plan and the direction must be reviewed on a periodic basis to ensure that both remain in accord with the current organizational climate and the current state of DBMS technology.

The plan must be based upon a phased approach. Identifiable deliverables should be identified and accomplished within time frames which will provide benefits for those concerned and whet appetites for future development.

The preceeding represents the general criteria for the successful launching of the DBMS enterprise. This is by no means everything that is required to be successful, but if these components are not present, certainly the ultimate value of the DBMS will not be realized. In this event, the success of any DBMS venture will be — on an objective basis — questionable.

Next: Management issues affecting DBMS success.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Work life-styles: jet-speed DPers vs. snail-paced users

HUMAN CONNECTION
Jack Stone

Without exaggeration, DPers run their worklives a mile a minute.

Reflect on it: Analysts and programmers in the large centers are in operating configurations that are in high-speed perpetual motion. They gorge themselves on vast volumes of technical data, self-driven to absorbing it all with hardly a moment of mental digestion. They accept — and accomplish — challenges of the third kind: difficult projects with impossible deadlines and meager support resources, like cramming a cord of code into a minuscule memory module in days instead of months. And they do it well in spite of frequent redirections from the higher-ups who have yet to appreciate fully and/or empathize with the heroic efforts in the centers. DP technology is flying along at jet speeds, and DPers are holding on to its wing tips — by their fingernails.

Enter the users, whose operations, loosely described as snail-paced, are the very antithesis of DPers. No mad rush within this group, certainly when compared with the denizens of the computer department; instead, there is time, plenty of it, for reflection, ratiocination and reportage.

Differences in "work life-styles," to coin a self-explanatory term, are painfully clear, and they constitute one major reason why our industry's version of the 30 Years' War (between users and DPers) may not end much before the 21st century. My conclusion is that until the two work life-styles become one, or fairly close, harmony between the two personality sets will never be reached, and the current level of cacophony may even intensify before it diminishes.

Perhaps the ultimate benefit from the personal computers is that they may be the unwitting vehicle for bridging the gap. Quick, accurate results derived quickly from a computer beget desires for more and faster results, a situation which, in turn, is slowly changing the operating style

See **STYLES** page 90

Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C.

Misuse of Cobol to blame for its premature aging

READER'S PLATFORM
Jerry Sitner

Unlike Richard L. Conner, in his In Depth article "Cobol, your age is showing" [CW, May 14], I wish to express my high regard for the creators of Cobol and Cobol itself.

The article implies that the U.S. Department of Defense decided on Cobol. What the Department of Defense decided was the need for a computer language that would be compatible with all hardware. The biggest computer hardware manufacturers and their users concurred. The Department of Defense did not prejudge as to what that language should be. As far as it was concerned, it could have been any of the languages available at that time. Languages like Fortran, assembler, Flowmatic — as long as they were made portable.

What did come out of the May 28, 1959, meeting was the decision to develop a new computer language and not use any of the languages then available. None of the available languages was conducive to understandable source coding; recognizing that was what prompted the decision for a new language. This new language did not have a name as yet. It was only later given the name COmmon Business Oriented Language.

The consensus of the Short-Range Committee was that this new language would be designed with readability as its No. 1 objective. It was also its opinion that ease of writing and language versatility were to be secondary to understandability. Remember, this committee was made up of the most computer-knowledgeable representatives of both business and government. They knew way back then that source coding clarity had a direct relationship with programming productivity. They further realized that since data processing was the computer-run-hub of most corporations, any increase in productivity there could have an immeasurable rippling effect on corporate productivity.

See **COBOL** page 92

Sitner is president of Clarity Concept Systems Co. in New York.

Enter service bureau; exit programming department

READER'S PLATFORM

T'Pell Wilson

I have been following the various debates about this profession we all know and love for a good many years, much of it in the pages of *Computerworld*. Ongoing debates claim that programmers are antisocial or that programmer managers do not have the proper skills or background to manage; backlogs are criminal, efficiency is rotten, we can't get support from our supervisors or acceptance from our users and so on.

Wilson is manager of DP at Great Southwest Life Insurance Co. in Houston.

Perhaps we are being just a little bit hard on ourselves. Like most people, we tend to see ours as being one of the most important jobs; perhaps we might do ourselves and our co-workers a bigger favor by looking at ourselves in comparison with other professions more often. We closet ourselves at our terminals all day, but what about the controller who sits sheltered behind his books for similar periods of time? We don't have "people skills," but neither does the clerk whose only concept of conversation is gutter-level gossip. Perhaps we all could use a bit of introspection and some exposure to those admittedly important critical messages.

One of the frequently mentioned problems with data processing people is their supposed loyalty to the profession instead of to their companies. Being thoughtful and having read much on this subject, I have at least tried to project an image of company loyalty to all my co-workers. Even when not heartfelt, such an image would help non-DPers to feel more comfortable whenever they had to work with me, or so I thought.

After many years of bad jobs (and some very real abuse), I finally found a job and a company that I enjoyed. Suddenly, it wasn't just a pose; I liked what I was doing and wanted to keep on doing it indefinitely. For 3½ years, I worked very hard to help my company turn around some of the data processing problems that had built up over the years. I thoroughly enjoyed myself and felt that I was, indeed, at last accomplishing something that I could be proud of. Never mind that I got neither pats nor pans; I knew what a great job I was doing, and it felt good.

The end result

The end result? Last week I was informed that, as of Sept. 1st, my entire department is being closed down in favor of a service bureau. My company is being civilized about it; we can stay as long as we like until that date, and if we find another job, we are free to go on two weeks' notice. If all I cared about was finding a job, I'd be in pretty good shape. After all, I've got four months to find a position.

Except that I do care. I can foresee the problems that my (!) company and my co-workers are going to have during the changeover, and I'm convinced, knowing its needs, that it may very well regret this move. However, by the time that happens, a year or so down the line, it will be too late to pull the old department back together.

Maybe we are selfish, egotistical

See **ENTER** page 93

STYLES

from page 89

of the users for the better; personal computer successes impel users to work more quickly and — thank heaven — more accurately. Personal-computer-experienced users are more accepting of big system foibles, less quick to criticize minor deficiencies and more tolerant of those who support those big systems.

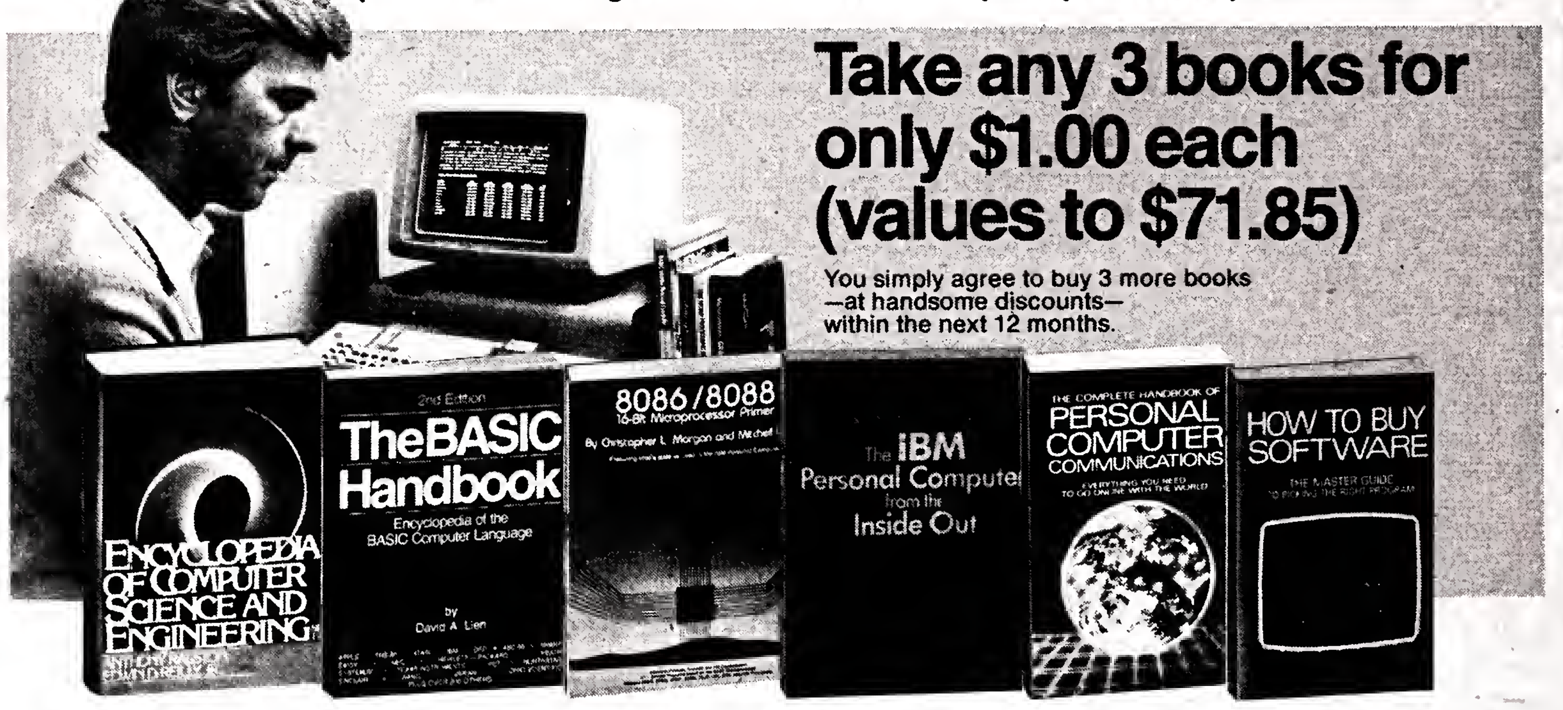
Indeed, the information intake juices of personal computer users are flowing, though still low grade in contrast with the data ingestion capabilities of DPers. Many users are beginning to sense the thrills of achievement that come from witnessing significant production pour out on a printer.

Even more relevant to the topic at hand is that personal computers are helping the users learn the DP business, not from its abstract underlying theory, but from the reality of its practice. Their knowledge is rapidly moving beyond mere literacy — which alone would have satisfied the clamoring of the vast ranges of the DP population — into the previously sacrosanct areas dealing with how the computer operates the way it does, why various design choices were made and the advantages of alternative operating system configurations.

If things keep going at the current rate, micro users will not only crack the deeply shrouded mystery of what DPers do all day long, but may learn to appreciate the DPer's enormous productivity and even acquire some of it. And when this occurs, the work life-styles will converge, and the great wars will end. ‡

SMALL COMPUTER BOOK CLUB

a division of the Library of Computer and Information Sciences
(the oldest and largest book club for the computer professional)



Take any 3 books for only $1.00 each (values to $71.85)

You simply agree to buy 3 more books
—at handsome discounts—
within the next 12 months.

ENCYCLOPEDIA OF COMPUTER SCIENCE AND ENGINEERING
2nd Edition
The BASIC Handbook
Encyclopedia of the BASIC Computer Language
by David A. Lien
8086/8088
16-Bit Microprocessor Primer
The IBM Personal Computer from the Inside Out
THE COMPLETE HANDBOOK OF PERSONAL COMPUTER COMMUNICATIONS
HOW TO BUY SOFTWARE
THE MASTER GUIDE TO PICKING THE RIGHT PROGRAM

(Publishers' Prices shown.)

44904-3. ENCYCLOPEDIA OF COMPUTER SCIENCE AND ENGINEERING. Second Edition. *Edited by Ralston and Reilly*. Now available, the thoroughly revised, updated and reorganized ENCYCLOPEDIA features 550 articles—over 1,670 pages—500 photos and over 250 diagrams, graphs and charts on virtually every aspect of the computer sciences. *Counts as 3 choices.* $87.50

35529. THE BASIC HANDBOOK. Second Edition. *David A. Lien. The* reference-encyclopedia of the BASIC language. Softbound. $19.95

43965. 8086/8088 16-BIT MICROPROCESSOR PRIMER. *Morgan and Waite.* Softbound. $18.95

54453. THE IBM PERSONAL COMPUTER FROM THE INSIDE OUT. *Sargent & Shoemaker.* Softbound. $16.95

39796. THE COMPLETE HANDBOOK OF PERSONAL COMPUTER COMMUNICATIONS: Everything You Need to Go Online with the World. *Alfred Glossbrenner.* Softbound. $14.95

40836. CP/M AND THE PERSONAL COMPUTER. *Dwyer and Critchfield.* Softbound. $19.95

53678. HOW TO BUY SOFTWARE. *Alfred Glossbrenner.* Softbound. $14.95

84832. TROUBLESHOOTING AND REPAIRING PERSONAL COMPUTERS. *Art Margolis.* Softbound. $13.95

49428-2. FUNDAMENTALS OF INTERACTIVE COMPUTER GRAPHICS. *Foley and Van Dam.* The representation of 3D shapes, shading models, intensity and color, creating realistic synthetic images, and more. *Counts as 2 choices.* $36.95

36455. BLUEBOOK OF ASSEMBLY ROUTINES FOR THE IBM PC & XT. *Christopher Morgan.* Ready-to-run, easy-to-use assembly programs, all pretested, debugged and fully annotated. Softbound. $19.95

65233. OH! PASCAL! *Cooper and Clancy.* A lucid and witty self-teaching guide. $17.95

41639. DATABASE: A Primer. *C.J. Date.* Softbound. $12.95

79170. THE SOFTWARE SIFTER: An Intelligent Shopper's Guide to Buying Computer Software. *Frankel and Gras.* Spiralbound. $24.95

46347. EVERYMAN'S DATABASE PRIMER. *Robert A. Byers.* Softbound. $19.95

34085. THE APPLE MACINTOSH BOOK. *Cary Lu.* Softbound. $18.95

34150-2. APPLIED CONCEPTS IN MICROCOMPUTER GRAPHICS. *Bruce A. Artwick.* Over 150 illustrations, 14 in full color. *Counts as 2 choices.* $27.95

34620. ASSEMBLY LANGUAGE PRIMER FOR THE IBM PC AND XT. *Robert Lafore.* Softbound. $21.95

35496. BACKGROUND MATH FOR A COMPUTER WORLD. *Ruth Ashley.* Softbound. $10.95

56515. INTRODUCTION TO WORDSTAR. *Arthur Naiman.* $21.95

37192. THE BYTE GUIDE TO CP/M-86. *Mark Dahmke.* Softbound. $16.95

39986. COMPUTER LANGUAGE REFERENCE GUIDE. Second Edition. *Harry L. Helms, Jr.* Softbound. $9.95

40862. CRASH COURSE IN MICROCOMPUTERS. Second Edition. *Louis E. Frenzel, Jr.* Clear and simple. Combbound. $21.95

42215. DICTIONARY OF COMPUTING. *Illingworth, Glaser and Pyle, Eds.* Over 3,750 entries. $24.95

42540. DOS PRIMER FOR THE IBM PC & XT. *Waite, Angermeyer and Noble.* Softbound. $14.95

47440. EXPLORING THE IBM PC/Jr. HOME COMPUTER. *Peter Norton.* Extensively illustrated. Softbound. $18.25

53679. HOW TO DESIGN, BUILD AND PROGRAM YOUR OWN ADVANCED WORKING COMPUTER SYSTEM. *Robert P. Haviland.* $16.95

56210-2. INTRODUCTION TO BUSINESS TELECOMMUNICATIONS. *George W. Reynolds.* Solid overview of the latest issues, techniques and technology. *Counts as 2 choices.* $26.95

58047. LEARNING IBM BASIC. Revised Edition. *David A. Lien.* Softbound. $19.95

62613. THE MICROCOMPUTER BUILDER'S BIBLE. *Chris Johnston.* $18.95

62628. MICROSOFT BASIC. Second Edition. *Ken Knecht.* A comprehensive tutorial on programming in BASIC using Microsoft version 5.0. Softbound. $15.95

80016. SPREADSHEET SOFTWARE: From VisiCalc to 1-2-3. *Henderson, et al.* Softbound. $15.95

80158. STANDARD PASCAL USER'S REFERENCE MANUAL. *Doug Cooper.* $12.95

41650. DATA FILE PROGRAMMING IN BASIC: A Self-Teaching Guide. *Finkel and Brown.* Softbound. $12.95

81300. SUCCESSFUL SOFTWARE FOR SMALL COMPUTERS: Structured Programming in BASIC. *Graham Beech.* Softbound. $14.95

MEMBERSHIP BENEFITS: In addition to getting any 3 books for only $1.00 each, when you join, you keep saving substantially on the books you buy. Also, you will immediately become eligible to participate in our Bonus Book Plan, with savings up to 70% off the publishers' prices. At 3-4 week intervals (16 times per year) you will receive the Book Club News, describing the coming Main Selection and Alternate Selections, together with a dated reply card. If you want the Main Selection, do nothing and it will be sent to you automatically. If you prefer another selection, or no book at all, simply indicate your choice on the card, and return it by the date specified. You will have at least 10 days to decide. If, because of late mail delivery of the News, you should receive a book you do not want, we guarantee return postage.

41622. DATA BASE MANAGEMENT SYSTEMS: A Guide to Microprocessor Software. *David Kruglinski.* Softbound. $16.95

65698. 100 READY-TO-RUN PROGRAMS AND SUBROUTINES FOR THE IBM PERSONAL COMPUTER. *Bretz and Craig.* Softbound. $15.95

87972. WRITING IN THE COMPUTER AGE: Word Processing Skills and Style for Every Writer. *Fluegelman and Hewes.* Softbound. $10.95

35552. BASIC AND THE PERSONAL COMPUTER. *Dwyer and Critchfield.* Softbound. $15.95

55865. INTERFACING MICROCOMPUTERS TO THE REAL WORLD. *Sargent and Shoemaker.* Examples feature the Z-80 microprocessor. Softbound. $15.55

62616. MICROCOMPUTER GRAPHICS. *Roy E. Myers.* Softbound. $12.45

SMALL COMPUTER BOOK CLUB

(a division of the Library of Computer and Information Sciences)
Riverside, New Jersey 08075 Y-AF3

Please accept my application for trial membership and send me the three volumes indicated, billing me only $1 each. I agree to purchase at least three additional Selections or Alternates over the next 12 months. Savings range up to 30% and occasionally even more. My membership is cancellable any time after I buy these three books. A shipping and handling charge is added to all shipments.

3 books for $1 each.
Indicate by number the books you want.

A few expensive books (noted in the book descriptions) count as more than one choice.

No-Risk Guarantee: If you are not satisfied—for any reason—you may return your introductory books within 10 days and your membership will be cancelled and you will owe nothing.

Name____________________

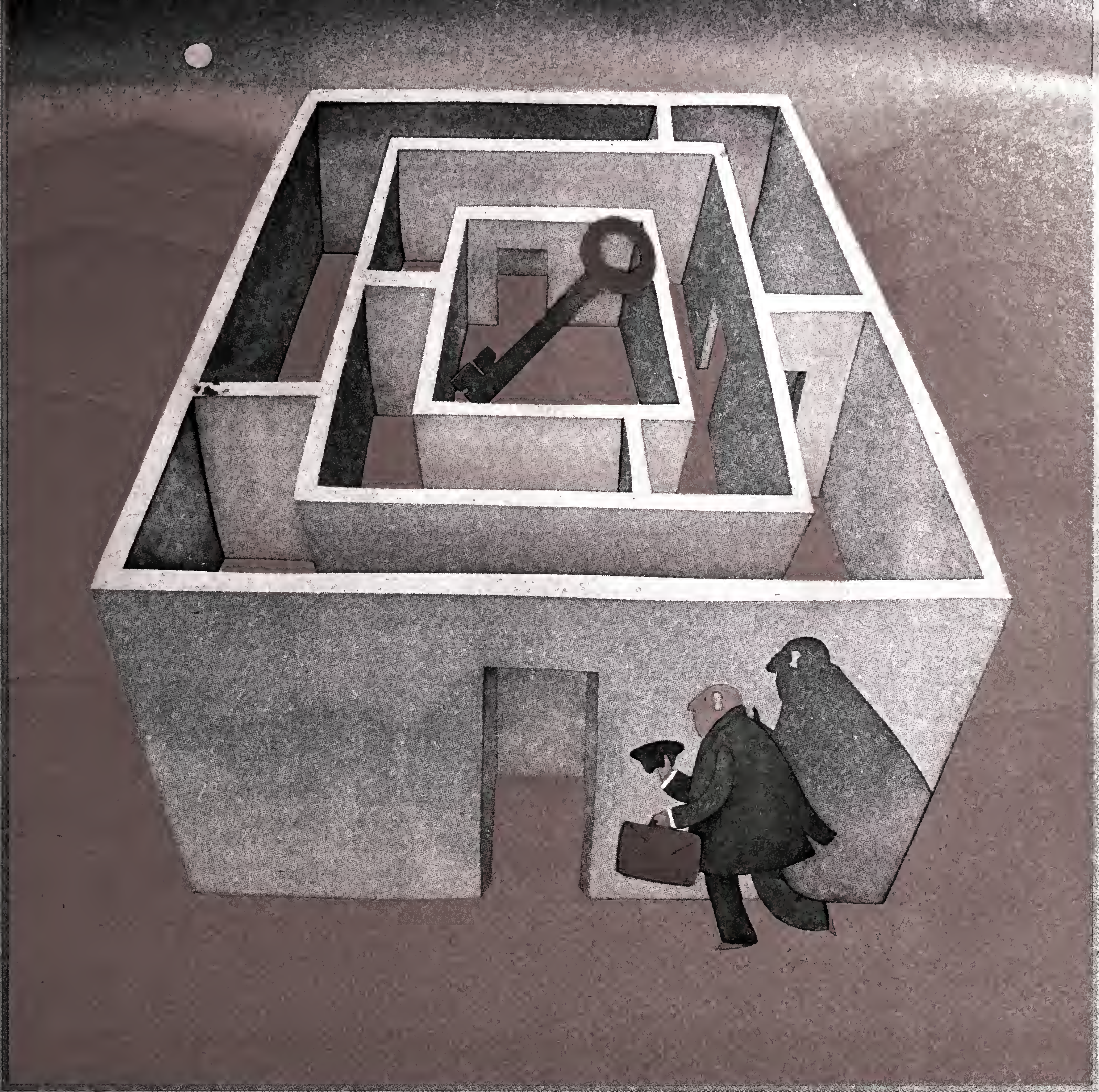
Address____________________

City____________________

State____________ Zip________

What make/model small computer do you use?

(Offer good in Continental U.S. and Canada only. Prices slightly higher in Canada.) Computerworld 6/11/84



You Have Every Right
To Use Your Brain.
Don't Let Your Job Keep You
From It.

After all, isn't that your primary value to the organization — the non-routine, creative use of your brainpower to satisfy business needs? But your job can easily sidetrack you with housekeeping chores.

Today's management often spends so much time paving a path from computer to customer that there's little time for anything else. American Software's applications can fill that need, by pulling data together so it's more meaningful both to your own and your customers' management.

American Software has been talking your language for 14 years now. Our software recognizes the natural interrelationships among business functions and pulls them together in creative ways. We'll show you how our materials management software can be the key to unlocking your management's brainpower — the key to the power of the right decision.

*American Software: **The Power of the Right Decision.**™*

®AMERICAN
SOFTWARE®
THE MANAGEMENT SYSTEMS COMPANY

443 E. Paces Ferry Rd., Atlanta, GA 30305 (404) 261-4381

© 1984, American Software, Inc.

COBOL

from page 89

They could see that programming maintenance was fast becoming the Achilles; heel of data processing. Data processing was spending more and more of its budget on maintenance.

This call for understandability came at a time when computer hardware and software were archaic when compared with current systems.

Thank goodness for the Short-Range Committee's sharpness. It was able to see what Conner missed, that the English dictionary is a great standards tool.

It was not the committee's fault that the intelligent use of English was ignored from the very first day of Cobol's usage and that a deeply embedded, insidious quick-coding discipline ensued. For years, this counter-productive discipline was encouraged by the use of lines of code per day as a measurement of programming productivity. The result is the incomprehensible Cobol coding that Conner mentioned.

Simplicity's beauty

Quoting Conner, ". . . that it was vain to hope that the problems could be relieved by anything so simple-minded as an English-like language," I believe the best response to that is a quote that every artist worth his salt will recognize: "Simplicity is the keynote of art."

Conner wrote that, in Cobol, "reserved words foreclose the programmer's choice of appropriate self-documenting names." I am at loss as to what he is referring to. The word PERFORM is one of many reserved words. A programmer is permitted to use PERFORM or any other reserved word in a data or paragraph name. Example: 1010-PERFORM-TAX-DEDUCTIONS. The word PERFORM is also not precluded from being used as part of a comment. Perhaps I missed Conner's point.

There is a statement by Conner with which I wholeheartedly agree: "The noise isn't harmless. Any time we encounter non-English embedded in what purports to be English, we hesitate. . . . It's distracting; it interrupts thought." What Conner had failed to see was that the quick-coding discipline is what encourages non-English words and abbreviations.

There is nothing inherent in Cobol that encourages nonmeaningful names. That encouragement comes from outside of Cobol and is still prevelant in our industry. The creators of Cobol tried to give us every opportunity to use clear English. Witness the availability of 30 positions for data and paragraph names.

As for the remainder of the article, which continues to belabor Cobol unjustly, I would say this: It is my firm belief that Conner has yet to see a Cobol program that is clearly understandable and easily modifiable. Most of us have not seen such a program — they are rarely written. This is not Cobol's fault. The blame lies with us and our quick-coding discipline.

Too many in our industry have snubbed their nose at Cobol — a computer language for which we should thank our lucky stars. In spite of the way it has been misused, it has still performed admirably for business and government these 25 years.

If our industry wishes to see Cobol truly reach its potential, we must turn that insidious quick-coding discipline into a productive clarity-coding discipline.

A belated happy birthday, Cobol, and many more. ‡

It was not the committee's fault that the intelligent use of English was ignored from the very first day of Cobol's usage and that a deeply embedded, insidious quick-coding discipline ensued. For years, this counter-productive discipline was encouraged.

The Northern Telecom system:
A benchmark in batch processing
that keeps getting better.

Northern Telecom batch processing systems have proven themselves, in more than a decade of use in a variety of applications, to be among the most reliable, practical, cost-effective systems ever developed. They deliver more throughput per dollar than any competitive system.

Now, as solid evidence of our commitment to batch processing, we're improving these already-successful systems for even more productivity. For instance, we're introducing a new high-speed band printer with changeable type. Operating now with IBM's SNA, we've also added new, low-cost distributed data processing capabilities for more system versatility, and to provide for future growth toward the integrated office.

We're back

Use consultants effectively when developing systems

READER'S PLATFORM
Allen B. Suopys

At Campbell Soup Co., the world of management information systems has grown and become enormously complex. The demand for services has significantly dwarfed available resources. We talk about five-year backlogs and getting to a specific project, if given a top priority, in 1988. These are true challenges in managing an MIS environment.

There are three ways that such demands can be addressed. First, allow clients to develop their own systems with user-friendly tools. Second, if resources are fixed, use time as the variable. Unfortunately, the client community considers this unacceptable, and they accuse MIS of being nonresponsive. Finally, we can supplement our existing staff by hiring more people or by using outside consulting services.

How does a corporation use external consultants effectively when developing new systems? Webster's dictionary defines a consultant as "one who gives professional advice or services." Others sometimes define consultants as people who paint bull's-eyes around bullet holes.

Many people perceive consulting as a benefit to their organization. At the same time, many others say that they had a tragic experience with consultants. If we analyze this more clearly, we would find that some of the firms that have worked on similar projects with different companies have had both successes and failures. This poses an interesting point. Can an experienced consulting firm have a success in one location and a failure in another when working for the same company and applying the same approach?

The answer is "yes" because the agreed-upon product was not understood by the client. Expectations did not conform to reality. Since the customer is always right, this leaves the consultant in a no-win position.

Companies use consultants for five reasons:

- Because consultants have installation experience — they've done it before.
- They supplement internal resources, or they meet needs that cannot be filled by internal resources.
- They can provide training for company people.
- They are able to deal at all levels within a company.

Who wants consultants? Consultants want consultants. Executive management wants consultants —

See **CONSULT** page 96

Suopys is corporate director of Campbell Soup in Camden, N.J.

ENTER from page 90

people who care about no one but ourselves. I don't believe a word of it. We are all familiar with the attitudes of non-DPers, particularly the attitude which insists that computers are black boxes full of evil spirits and that anyone who can work with them must have something very wrong with them.

If we hide behind our terminals, perhaps it is because we have been driven out of most of the rest of the company. If we are loyal to our profession, perhaps it is because only within our profession can we feel any security in our jobs. It is just too darned easy for a company to look at a data processing department as a drain on company finances, rather than the money- and time-saver that it really is.

I only hope that I can care about and enjoy my next job as much. I don't mind having to look for another job, but I feel a little bit like I've just been told that I have to give my three-year-old child up for adoption. It hurts. ‡

Your processing may be remote, but Northern Telecom service is on the spot.

With service and maintenance professionals located at 157 cities nationwide, we're able to provide prompt response to your call for service. How fast? Two hours in major metropolitan areas; four hours in most other areas of the country. And our multi-year maintenance agreements guarantee continuing, low-cost operation of your Northern Telecom system.

If your system lease expires within the next six months, *now* is the time to find out more about batch processing from Northern Telecom.

Time-proven performance with long-term savings.

Northern Telecom's aggressive pricing is more proof of our commitment to batch. Our discount structure offers long-term savings on multi-year leases. And at renewal time, you can save even more with discounts up to 30%.

Call our toll-free number: 800-331-3113. Or write Northern Telecom, Mail Station T-240, P.O. Box 1222, Minneapolis, Minnesota 55440. We'll show you how we can tailor a batch system to your specific needs. And save you money, too.

nt northern telecom

ing batch!

LETTERS

Self-righteous drivel?

I am disappointed that *Computerworld* saw fit to publish the article by Richard C. Holt and the one by Richard L. Conner in the In Depth section [CW, May 14]. The business (and, indeed, the scientific) community doesn't need this kind of self-serving, self-righteous drivel.

Holt thrills us with the creation of another language. Well, gosh, that's exactly what our business needs — another language.

For God's sake, it's getting so that every guy going for his master's in DP writes another compiler. Enough already! I am sure Holt and his team had a great time creating Turing, but he just contributed one more building block to the Babel tower.

Conner does his bit by telling us how bad Cobol is. I'm sure he would like us all to program in more "elegant" languages (like Turing). The 1984 version of Cobol compiles quickly, produces very efficient code (for a high-level language) and when the guy that wrote it has left or been promoted — by God — we can read the darn thing! Elegance has its place, but business needs a language that can be maintained and that can process the four-million account master file in the two-hour processing window that we have every night.

If there are things that Conner likes that Cobol doesn't do, he should add them to the next release, subroutine them in another language or write a precompiler and stuff the feature in by himself, but he should stop criticizing a language that does the job well and is the de facto language of business today.

Earl L. Augusta
Huntington, Conn.

Richard L. Conner quoted Jean Sammet as saying that "people whose main interest is programming tend to be very unhappy with Cobol." I have found this to be true, but in my experience, the thing these people dislike most about Cobol is that all data names need to be defined, which is actually an asset.

It was reportedly the lack of this feature in Fortran that caused computer problems in one of the first space shuttle flights.

Conner wrote that "the typical program is hardly ever read by anyone, even by its author." He has obviously not had the problem of modifying another person's program. I would guess that if Conner has written any programs that other people have had to maintain, he has been the target of many curses.

Patricia Shannon
Huntsvilla, Ala.

Richard L. Conner's very strong statement: "Cobol's net influence on data processing progress has been negative; it has impeded more than it has helped" ignores a very important fact regarding the development of the language.

Cobol, introduced at the time of computing's infancy, was a major force in getting computing power into the hands of literally thousands of businesses and other computer installations, which before that time were afraid of the other contemporary, more technical languages. Computing progress was not impeded by placing power in the hands of more people.

Conner himself seems confused, declaring boldly he'd gotten students "to write and run programs in Fortran or assembly language by the end of the first class day," but that "it would take much longer to achieve a like result with Cobol." His final paragraph states that "it may be comparatively easy to teach our employees to write Cobol."

I, too, have come to the conclusion that there are better tools than Cobol on the market today. But unlike Conner, I do not feel it is fair to say that the Sopwith Camel has impeded the progress of flying just because it cannot keep up with the 747.

Patrick T. Brooke, CPA
Wheaton, Ill.

GE engineers can give your DEC system a text retrieval capability that's 100% accurate.

And a thousand times faster.

A thousand times faster than any typical software sequential text search and retrieval system.

Simply add a General Electric text array processor to your present DEC system. This gives you a stand-alone GESCAN 2™ high-speed text search and retrieval system with sequential search speeds of two million characters per second.

It makes possible true full-text search without key words, abstracts, or indices.

The GESCAN 2 search system eliminates missed references, complicated programming, index generation and maintenance, and extensive processing requirements common to software-based systems. Large volumes of text can be scanned word-for-word with state-of-the-art query constructs.

GE can apply this high-speed search technology to your military, engineering, scientific, law enforcement, publishing, and business needs today.

Leading from the start ... and working on the future.
Space Systems Division.

GESCAN Search and
Retrieval Systems, Suite 200,
1755 Jefferson Davis Highway,
Arlington, VA 22202. (703) 979-6000

GESCAN 2™ A trademark of General Electric Company
Registered trademark of General Electric Company

Child criminals

After reading the letter from Howard A. Karten [CW, April 23] condemning the school system for requiring a student hacker to undergo counseling, I had to speak up. Whether the school system is at fault for not properly motivating its students is no reason for allowing crime to go unpunished. True, the school system should motivate students to utilize their talents properly and should correct their situation if in error, but students also have the responsibility to act within the law.

I am tired of people making excuses for these child criminals. If encouraged, they will simply grow up to be adult criminals. We must reform these student hackers before they develop habits that will ruin their lives. As for raising his own grades and snooping, that doesn't take brilliance as Karten seemed to imply.

Just because, as Karten reminded us, our government has been guilty in this area, should we condone it and allow our children to do the same? We did not condone it as acceptable behavior from our government, and we should not allow it from our children.

S. G. Kennedy
Knoxville, Tenn.

Howard A. Karten's letter on the student hacker is an example of atheistic bias which cannot go unchallenged. Computer hacking is a moral issue involving stealing, bearing false witness and coveting a neighbor's goods (8th, 9th and 10th Commandments). Punishment should be according to the Biblical principle of restitution: Not only should the offender be counseled, but he should repay damages to the offended party.

It is deplorable that Karten considers lying and stealing permissible and excusable simply because of government wrongdoing. As for the American desire to get ahead, surely one can get ahead without violating moral and civil laws.

Ironically, Karten is right in identifying the influence of teaching creationism in the classroom as the impetus for high moral standards in society. Only when man is properly viewed as a moral creature with moral accountability to his Creator can society function harmoniously and productively.

Gary S. Flye
Tuscon, Ariz.

Documentation oversight

Jack Stone's column, "Commonsense ways to improve DP documentation" [CW, May 14], overlooks one of the most important rules of technical writing: Make a reasonable attempt to eliminate obvious factual errors. As the same column describes the "Tax Guide for Small Business" as a manual that supports the Internal Revenue Service's data processing system, the oversight is perhaps merely prudent.

Be that as it may, Stone's suggestions are good; their presentation did not, however, benefit from his being "well prepared emotionally" to apply them to a particular document.

Steven K. Johnson
Alexandria, Va.

Trademark vs. copyright

The article, "What's in a name? Success, if a vendor is lucky" [CW, April 16], used some terminology that may start your readers in the wrong direction in their quest for trademark knowledge.

Rather than referring to these names as trademarks and explaining the purpose of such a mark, the article dispensed some casual advice which may mislead. It was stated that two manufacturers were unable to use perspective names because of "possible copyright violations."

None of the subject matter discussed in the article relates in any way to copyrights. What is undoubtedly meant by the comment was that there would be possible trademark infringement if the names were to be used in the U.S. Copyrights, as your readers by now undoubtedly know, cover an expression of an author. For your readers, this would mean something such as the piece of software being sold. Copyrights have nothing to do with the name chosen. Trademark law governs this selection.

There is a tension and balance involved in trademark selection between those marketing the products who wish to carry a lot of descriptive meaning in the trademark and those, such as trademark attorneys, who wish to adopt distinctive trademarks which cannot be copied or closely mimicked by later users. The software vendor must seek a balance between these two attitudes.

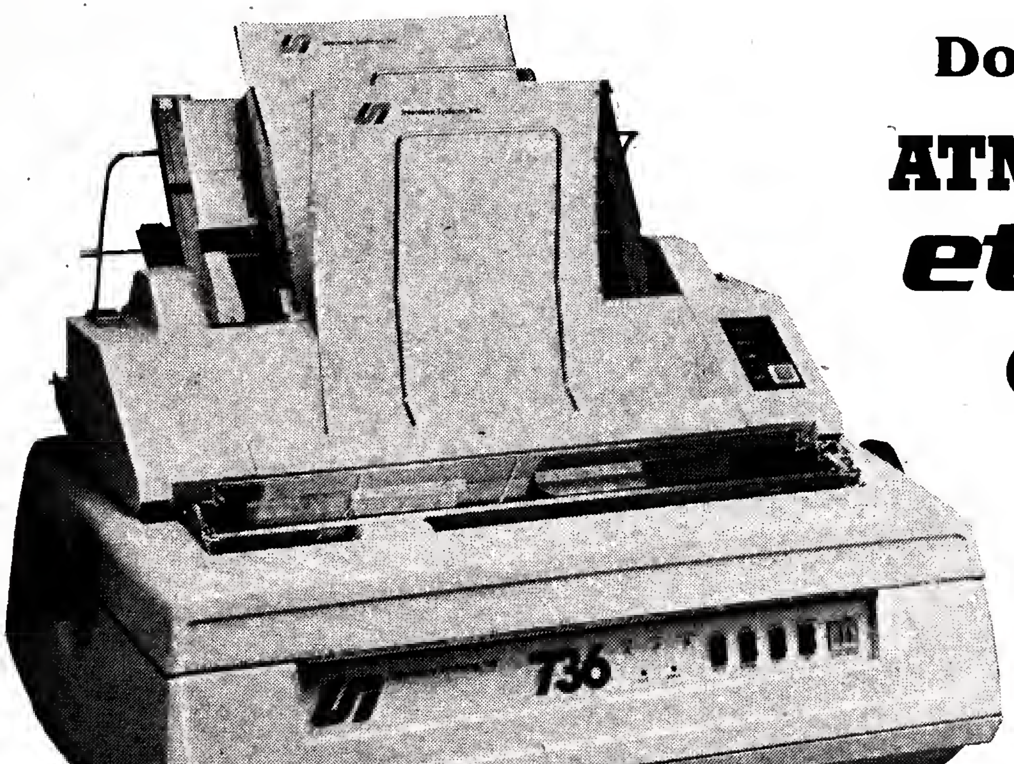
The best course of action is to consult your trademark attorney at the beginning of your search for a trademark so that the legal factors involved in the balance are represented to the same extent as the marketer's desire for descriptive recognition.

Robert J. Klepinski
Minneapolis, Minn.

__Computerworld__ welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.

Letters should be addressed to __Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.__

IBM 3270 Compatible!



Do you use:

ATMS SCRIPT
etc PROF
eMAIL
?

Our Model 736
Letter Quality Printer
plugs right in and gives you
automatic selection of cut sheets from two trays without making any software changes on your present IBM system.

The ISI-736 is plug compatible with the IBM 3287 for on-line printing from your IBM system. It works with all popular word processing packages.

Unlike the IBM 5210, it requires no expensive software changes to the system. Simply plug it in and it feeds cut sheets selectively from two hoppers under program control.

With multiple fonts and separate pitches, it will support most languages. Other features include underscoring and boldface capability.

Call, write or TWX us today!
We sell, lease and service nationally.

Interface Systems, Inc.

5855 Interface Drive, Ann Arbor, MI 48103
Telephone: (313) 769-5900, TWX: 810-223-6058
or call toll free 1-800-544-4072

Ask about the ISI-487, too, a high speed dot matrix printer that allows you to tear off output immediately, without wasting forms. Also prints large characters for labels.

CONSULT

from page 93

because they bring professionalism that sells at the top, and they bring broader perspective to problems. MIS management wants consultants. Historically, they haven't been wanted because they have been perceived as competition; they have been viewed as a threat because they identify problems and because MIS management has considered them expensive. But today, they're necessary.

> *MIS management wants consultants. Historically, they haven't been wanted because they have been perceived as competition; they have been viewed as a threat because they identify problems and because MIS management has considered them expensive. But today, they're necessary.*

There are sins in consulting, however, including the following:

■ Short-term gain. Consultants are interested in short-term gain because promotional opportunities within their firms are based on how much revenue they generate.

■ Overselling. In some cases, consultants have a tendency to oversell their abilities without totally understanding the problem. They imply added value, which is difficult to quantify.

■ Expansionism. They are seen as trying to enlarge the scope of an existing engagement or to solicit new business within the company where they are working on a project.

■ Hiding problems. Consultants frequently are quick to point out client deficiencies — but are not as eager to identify their own internal problems.

■ Coveting knowledge. Consulting firms, while working for a client, covet knowledge in order to add to their own resources. They must know more than the client. There is no motivation for the consultant to share his knowledge; once the client is as knowledgeable as the consultant, the consultant is no longer required.

■ Cultural conflict. Consultants' internal organizations are generally not the classic pyramid of most organizations. Consultants do not have to wait for a position opening to be promoted. Consequently, promotion is a product of contribution; therefore, their organizations can grow horizontally as well as vertically.

Also, consultants are generally well-educated and well-seasoned. They are willing to devote enormous amounts of overtime to a given project; their opportunity for promotion is built upon their perceived value to the consulting firm. This leads to cultural conflict, because in the average corporate environment, normal working hours are the rule rather than the exception. Therefore, resentment grows toward consultants because their work ethic is different. Since they work so many hours, they become extremely knowledgeable in the specific project activity — frequently more knowledgeable than the other members of the project team.

Clients also commit sins

Much has been written about the negative aspects of the consulting practice, but clients are also guilty of a number of sins:

■ Clients expect perfection. They have utopian ideas about the perfect system, yet they are not willing to pay the price.

■ Clients consider consultants expensive. They feel that the consultants are expensive, but have no basis with which to compare the cost of doing a project themselves, nor do they have a way to evaluate the quality of the product upon completion.

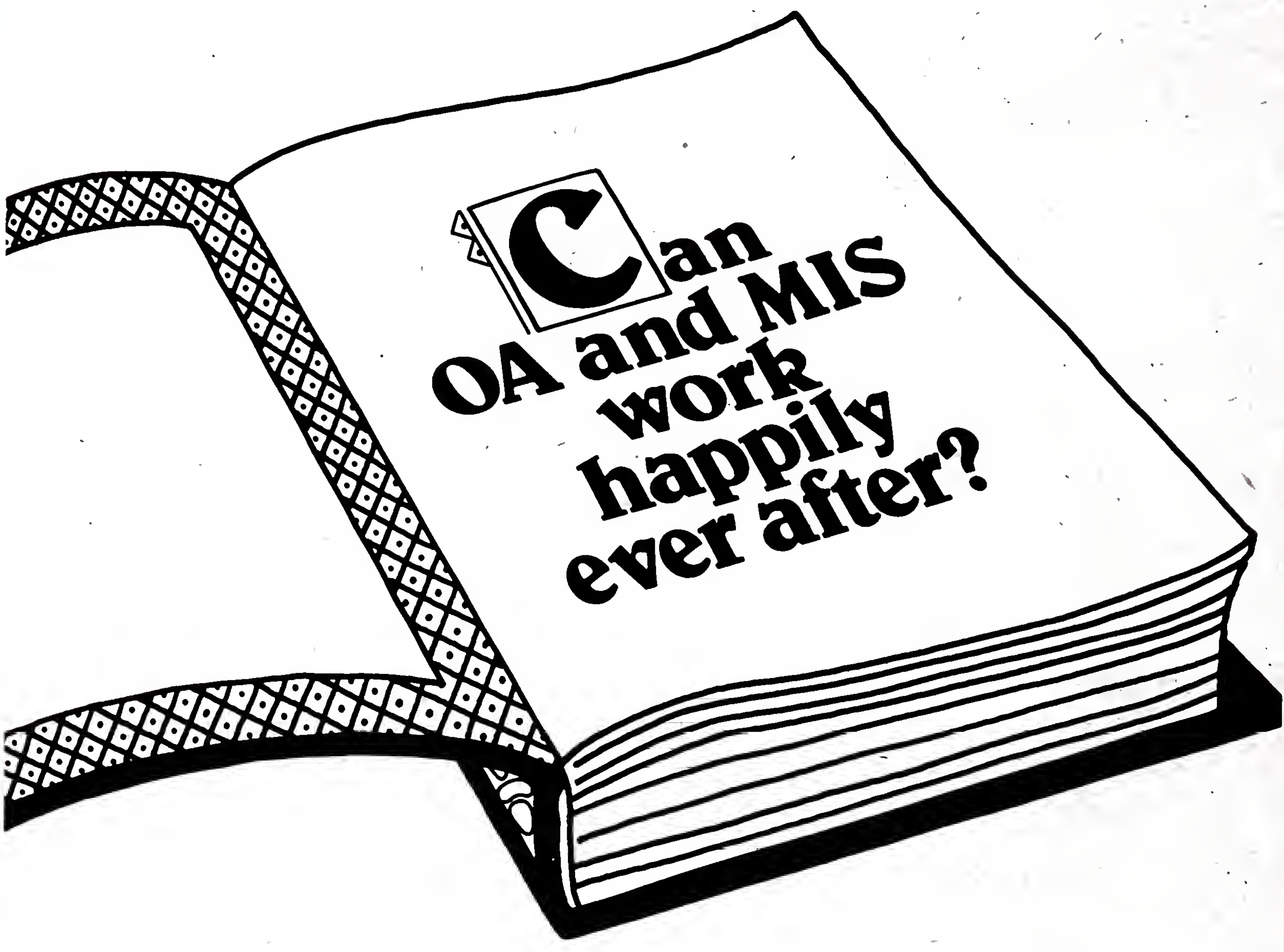
■ Clients abdicate responsibility. It is easier for clients to assume the role of critic rather than that of player.

■ Clients make scapegoats of consultants. When a project gets into cost and time overruns — or worse yet, does not meet business objectives — the consultant is blamed.

■ Clients are naive. In many instances, they recognize far too late that consulting is also a business, and as in any business, making money is the objective. If the client allows himself to grow totally dependent on a consultant, then the client will have to pay to become independent.

My recommendation is to use consultants wisely — they can provide an extremely valuable resource. The client should always assume responsibility for managing the project. Since consultants define their contract with the client as an engagement, the client company must clearly quantify the deliverables to be derived from this engagement and must clearly define the disengagement.

A project should be divided into small modules, with each module declared as an individual engagement. A segment within each module should be called disengagement, where knowledge and know-how is passed from the consulting firm to the client. This ought to be clearly defined in terms of man-days, costs and who does what to whom. In the event that the consulting firm does not effectively disengage, then it should stay on board in a nonbillable situation until it can complete that segment. ‡


Can OA and MIS work happily ever after?

Don't miss
"SUCCESSFULLY MERGING OA AND MIS"
Latest in a series of
videotaped updates,exclusively from DELTAK's Special Edition:
Computerworld Reports.

Once upon a time, the MIS department controlled the most powerful corporate information resources in the land. Then Office Automation arrived with word processing. Electronic mail. Document storage. Voice mail. Until one day, many functions of MIS were bordered by those of OA. Can these two different "kingdoms" work successfully together? Are there strategic solutions? Who has the final say?

Before these issues confront you, be sure to view "Successfully Merging OA and MIS," another up-to-the-minute video report from DELTAK and CW Communications. In 30 lively minutes, you'll experience the important insights of host John Gantz, as well as a panel of leading industry experts.

But there are other chapters in this series you might have missed. Previous video releases you'll also want to order, like:

☐ The Micro/Mainframe Link
☐ Integrated Microcomputer Software
☐ Managing the Communications Network
☐ Divestiture: Impact on Information Management
☐ Micros: An MIS Responsibility?

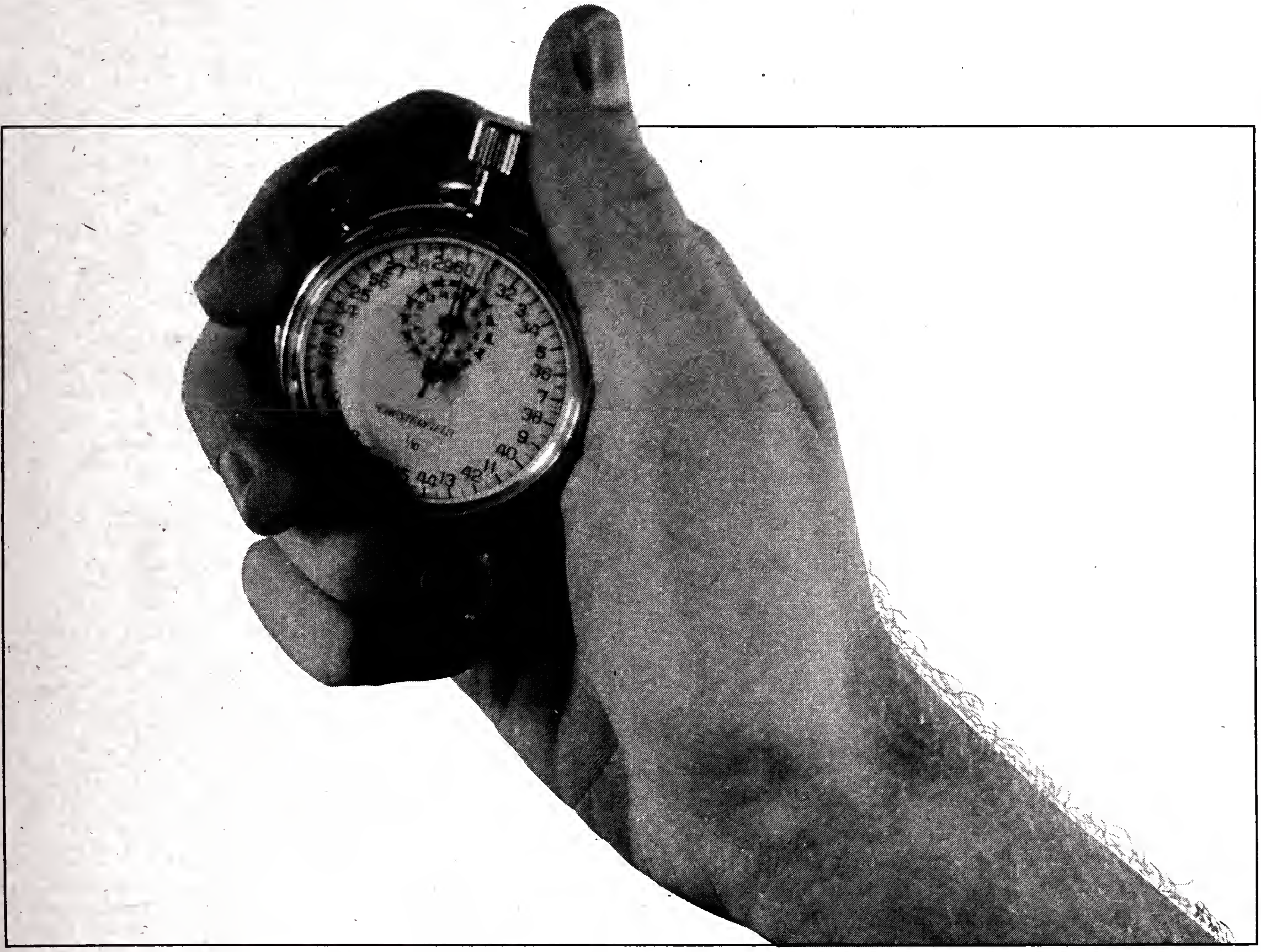
Learn how to ensure the success of OA and MIS, and write your own happy ending. Call DELTAK order entry at (312) 369-3000 and ask for Special Edition: "Successfully Merging OA and MIS." In Canada, call (416) 678-9222.

DELTAK
East/West Technological Center
1751 West Diehl Rd., Naperville, IL 60566
(312) 369-3000 (800) 532-7686

CW COMMUNICATIONS/INC.
375 Cochituate Road
Box 880, Farmingham, MA 01701
(617) 879-0700

© 1984, DELTAK, Inc.

IN DEPTH



A user challenges value of subsecond response time

The charts and statistics generally used to argue the value of subsecond response create an impression not necessarily supported by the underlying data. One study at Wisconsin Electric presents a different interpretation.

By Lawrence J. Kosmatka

Studies in recent years claim to show that productivity gains of 100% or more are possible by reducing system response time from three seconds to three-tenths of a second. These gains, according to the research, are only partially attributable to the improvement in system response time. Most of the benefit is attributed to a dramatic decrease in the user's "think" time between transactions.

At a three-second response time, users spend approximately 17 seconds formulating their next command. At three-tenths of a second response time, this formulation period drops to 9.4 seconds, clearly suggesting a significant productivity gain.

"Each second of system response degradation leads to a similar degradation added to the user's time for the following (command)," wrote W.J. Doherty and R.P. Kelisky in the *IBM Systems Journal* (18, No.1, 1979). "This phenomenon seems to be related to an individual's attention span. The traditional model of a person thinking after each system response appears to be inaccurate. Instead, people seem to have a sequence of actions in mind, contained in a

The short-term memory theory offered by Doherty and Kelisky (and later substantiated by Thadhani and others) is, to a great extent, an application of a theory whose validity is premised on statistical illusion and is an insufficient explanation of the observed think-time phenomenon.

short-term mental memory buffer. Increases in SRT (system response time) seem to disrupt the thought processes, and this may result in having to rethink the sequence of actions to be continued."

Another IBM publication, "The Economic Value of Rapid Response Time," reported corroborative research: "In a pioneering article, inspired by Doherty's work, Arvind J. Thadhani of IBM's San Jose Laboratory suggests that the number of transactions a programmer completes in an hour increases noticeably as system response time falls and rises dramatically once system response time falls below one second.

"To illustrate (Figure 1), with system response of three seconds, Thadhani found that a programmer executes about 180 transactions per hour. But, bring system response time down to 0.3 seconds and the number of transactions the programmer can execute in an hour jumps to 371, an increase of 106%.

"Put another way, a reduction of 2.7 seconds in system response saves 10.3 seconds of the user's time (Figure 2 on ID/4).

G.N. Lambert writes in the *IBM Systems Journal* (23, No. 1, 1984): "Thadhani's curve is now well-known and confirms the finding of Doherty and Kelisky that productivity increases significantly when the response time is reduced to less than one second.

"Our findings lend support to the validity of the Doherty-Kelisky short-term memory buffer theory" (figures 3 and 4 on ID/4).

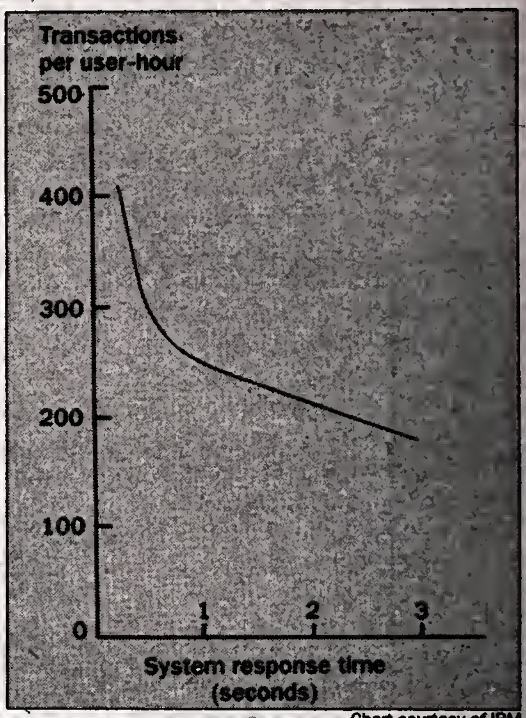


Chart courtesy of IBM

Figure 1. Relationship between system response time and the number of transactions a user can complete in an hour.

And, finally, Figure 5 (on ID/5) portrays the reduction in task time as one of the potential benefits of rapid system response, a direct correlation drawn between transaction rates and productivity.

Research objectives

The evidence for dramatic productivity gains from decreased response time may seem overwhelming. But on the basis of new studies at Wisconsin Electric, I propose to:

1. Demonstrate that the short-term memory theory offered by Doherty and Kelisky (and later substantiated by Thadhani and others) is, to a great extent, an application of a theory whose validity is premised on statistical illusion and is an insufficient explanation of the observed think-time phenomenon.
2. Demonstrate that the real productivity gain from subsecond response time in an applications development environment is significantly less than that proposed by Thadhani.
3. Offer a new explanation concerning the psychology of subsecond response time that is supported by observable behavior, physiological fact and previous psychological study.

The illusion

Wisconsin Electric's data processing organization first became interested in subsecond response time early in 1983. Following a methodology similar to that outlined by Thadhani in the *IBM Systems Journal* (20, No. 4, 1981), we gathered data from two distinct environments, both heavy in TSO/SPF usage, relating system response time to transaction rates. The first was a local environment on a 3081D processor; the users consisted primarily of technical support personnel. The second was a remote environment, using the same processor, supporting approximately 80 application development personnel.

By averaging transaction rates at various levels of system response, we produced the graphs shown in figures 6 and 7 (on ID/5). Figure 6, which was based on 36,800 individual 15-minute observations, matched Thadhani's curve closely. The overall average transaction rate per user hour for this group was 280. Figure 7, based on 86,700 observations, was also consistent with Thadhani's data though skewed to the right side

Some data security methods work better than others.

TOP SECRET the state-of-the-art resource protection package for MVS works best of all.

TOP SECRET is data security at its best. Offering quick installation, phased implementation and comprehensive resource protection, TOP SECRET outdistances all other data security methods for total resource protection.

TOP SECRET immediately secures your most critical resources without impacting normal processing. Implement security with no delay and with absolutely no modifications to your operating system.

TOP SECRET is the only total resource protection package that offers comprehensive CICS security, including file and program control and protection down to the field level.

By using the Standard MVS Security Interface, TOP SECRET becomes an integral part of your operating system. Complete compatibility with all IBM and vendor products that use Standard Security is automatic and guaranteed, now and in the future.

TOP SECRET security comes with the same top-notch technical support that guarantees the quality and reliability of all CGA software products.

Protect your valuable data resources today. Join the MVS sites across the country that have considered every data security method and made the sure TOP SECRET choice.

Call for additional product information and your free trial.

800-237-2057

cga
Software Products
Group, Inc.
800-237-2057
CGA Software Products Group
960 Holmdel Road
Holmdel, NJ 07733

One small step for Digilog. One giant leap for data comm test.

New family of automatic protocol analyzers interpret and isolate the error source for you

Meet the New Digilog 200, 400, 600, and 800 . . . four revolutionary diagnostic analyzers that can actually describe in plain English what is happening on your data lines.

Until now, analyzers more or less just displayed the data or the protocol. You had to do all the interpreting. . . and figure out the error source yourself.

Now the new Digilog analyzers can decode and interpret the protocol for you. Isolate faults automatically. Exactly. Even statistically analyze performance on your data lines.

Compare the new Digilog technology with anything else. Suddenly, we're a generation ahead of them all.

Digilog 200, automates data comm testing

Now, first time users can perform like experts. And seasoned professionals can do more . . . faster.

The Digilog 200 sets up automatically. Decodes protocols automatically. Analyzes protocols automatically. Tests devices automatically. And, of course, identifies the faults automatically. Sound easy to use? It is.

And, for flexibility, the Digilog 200 has just about any capability you can think of— EE PROM packs for program or data storage, remote control, typewriter-like keyboard, full programming, menu driven traps and triggers, CRT, help screens, six BERT tests, interface breakout, printer output, etc.

Digilog 400 and Digilog 600 For even greater sophistication

Here the emphasis shifts toward versatility, power and higher speed . . . up to 72K bits/second.

You get more programming power, bigger CRTs, built-in 3½" micro disks, soft function keys, graphics, protocol simulation plus all the features of the 200.

Digilog 800, the new technology

Meet the world's first protocol/performance analyzer.

Use the 800 to conquer the toughest data comm problems. Debug software programs. Improve the performance of your network.

The Digilog 800 offers you every conceivable diagnostic capability. Including fully selective and bit image recording, full protocol simulation, automatic protocol analysis through level 3 (X.25, SNA, etc.), and speeds to 256K bits/second.

The Digilog 800 also gives you on-line color graphics, internal 10 megabyte disk with selective logging and comprehensive statistical analysis with reports.
Nothing else comes close.

Digilog is out in front

Want to see what the new generation of Digilog analyzers can do for you? Call now for a demonstration (215) 628-4530.

Digilog Inc., Network Control Division
1370 Welsh Rd, Montgomeryville, PA 18936

DIGILOG
NETWORK CONTROL DIVISION

of the curve. The corresponding transaction rate for this group was 196.

Encouraged by what we were seeing, we began investigating means by which we could reduce the overall response time in our remote environment. Through a series of enhancements spread over a six-month period that included mainframe tuning, network tuning and moderate hardware upgrades, we were able to reduce the combined system and network response time from a mean value of approximately 2.5 seconds to a present-day value of 0.6 seconds (based on 95% of the transactions).

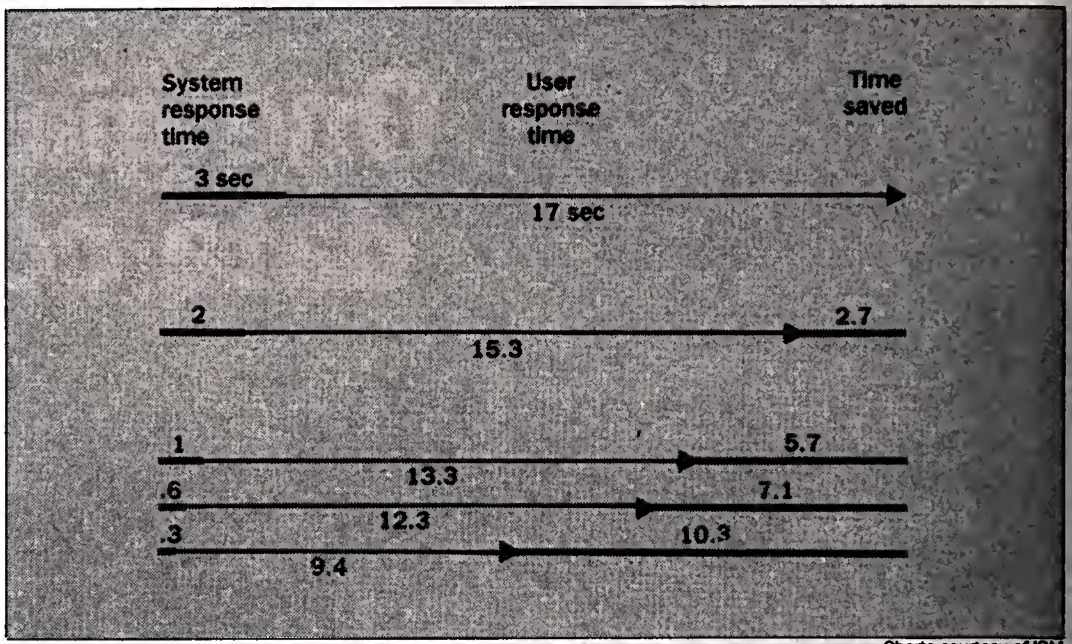
At each stage of the tuning process, we observed increases in user transaction rates and decreases in user response time that, again, were consistent with previous studies. During this period, the average hourly transaction rate rose to 290 from its previous level of 196, a 48% increase. User response time dropped from 15.9 seconds to 11.6 seconds, a 27% decrease (Figure 8). There was also a measurable increase in the amount of time a person was now spending on a terminal in a typical day, this figure rising from two hours to 2.7 hours.

Based on a 48% increase in productivity during one-third of a person's day (2.7 hours), it was "reasonable" to assume an overall productivity increase of the application development staff of approximately 15%. That translated into a significant number of dollars, no matter how you wanted to look at it. Either cut 10 people from the development staff of 80 and accomplish the same amount of work, or retain them all and gain the equivalent of 12 additional people.

However, the manager of applications development would have no part of it. He granted that our measures of terminal activity were probably accurate, but he could not notice an increase in productivity in his development staff. Not able to penetrate his armor, we dug deeper, and it was shortly thereafter that the illusion surfaced.

The conclusion drawn in earlier studies is based on the premise that users did not change the manner in which they performed their work. This concern has been raised and dismissed by Thadhani. In the *IBM Systems Journal* (23, No. 1, 1984), he addressed the subject as follows:

"There was a concern about using the count of interactions in a measure of productivity, with no consideration of the complexity or the end result of individual interactions. For example, terminal users may issue few but complex interactions at large response times and many but simple interactions at short response times.



Charts courtesy of IBM

Figure 2. User time saved as system response time improves.

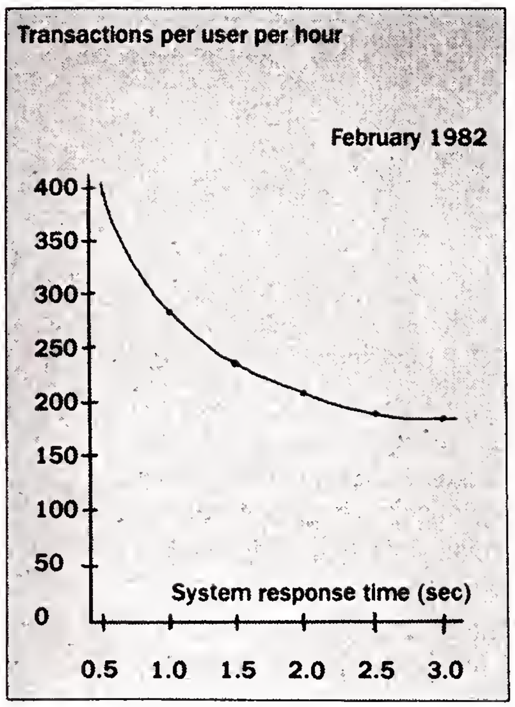


Figure 3. A typical monthly plot of user productivity.

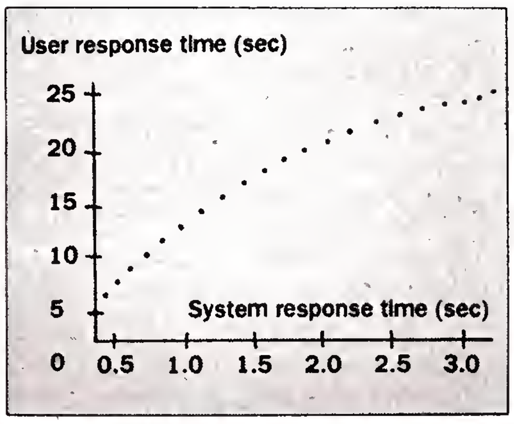


Figure 4. User component of the total transaction elapsed time.

The new IBM DisplayWrite

Little Tramp character licensed by Bubbles Inc., s.a.
*Prices apply at IBM Product Centers and may vary at other stores.
**Available in July, 1984.

System response time (sec)	Transactions per hour*	Task time (min)	Time saved per task (min)	Time saved per day (min)
3.0	180	60.0	—	—
2.0	208	51.9	8.1	84.8
1.0	252	42.9	17.1	136.8
0.6	279	37.7	22.3	178.4
0.3	371	29.1	30.9	247.2

*Based on Thadhani's data (Figure 3)

Chart courtesy of IBM

Figure 5. Computation of the time a user saves in a day as system response time improved from three seconds to .3 seconds.

In both instances, they achieve the same end result.

"The study explored computer measures of complexity, such as CPU cycles and the number of I/O requests per interaction, and found no significant change in these within the response time range of 0.25 seconds to 3.0 seconds. These data suggested that the average terminal user did not change the type of interactions; hence, number of interactions per user-hour was an appropriate measure of terminal users' productivity."

We, too, had seen little change in either CPU cycles or I/O requests per transaction over the period of the study and were inclined to believe that what little difference existed was, in fact, insignificant. However, watch how we can create the illusion of reduced think time with an "insignificant" change in user habits without changing the real think time at all and without necessarily changing resource usage. As an example, let us assume a transaction mix where 70% of the transactions are trivial, requiring one second of user time, and complex transactions require 60 seconds. If we compute an average user response time, we come up with the following:

$$\begin{array}{rcl} 70 \text{ x } 1 \text{ sec} & = & 70 \text{ sec} \\ +30 \text{ x } 60 \text{ sec} & = & \underline{1800 \text{ sec}} \\ & & 1870 \text{ sec}/100 \\ & & \text{transactions} \end{array}$$

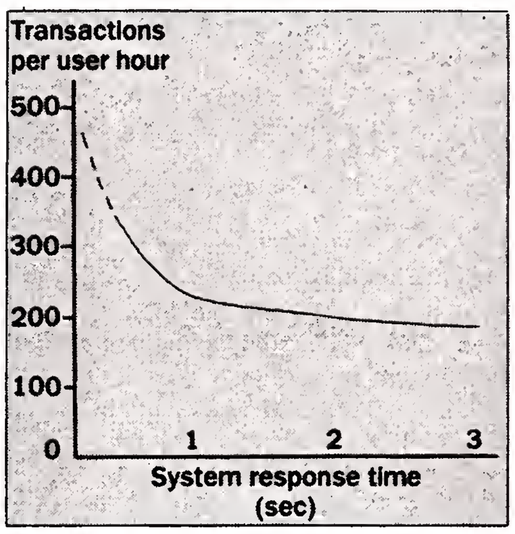


Figure 6. Relationship between system response time and transactions (local).

In other words, the average user response time is 18.7 seconds. Now, let us increase the transaction rate by 50% and change the mix to 76% trivial (to the user) and 24% complex with the same think times:

$$\begin{array}{rcl} 1.5(76) \text{ x } 1 \text{ sec} & = & 114 \text{ sec} \\ +1.5(24) \text{ x } 60 \text{ sec} & = & \underline{2160 \text{ sec}} \\ & & 2274 \text{ sec}/150 \\ & & \text{transactions} \end{array}$$

We now have an "average" user response time per transaction of 15.2 seconds. It appears that the think time has dropped, when, in fact, we know that for any specific transaction type, it didn't change at all. Note also that the change in transaction mix says nothing about resources consumed. They may be more. They may be less.

Now I grant that this example is contrived. The real applications development world is not made up of only one-second transactions or 60-second transactions. Or is it?

The facts of Figure 2 and Figure 8 (Wisconsin Electric) are that transactions average x number of seconds of user think time and that x changes as response time changes. Our perception is that x seconds is then the typical think time and that there is probably a relatively normal distribution of user response times around x. This perception is, in fact, not at all true. Figure 9 is a detailed frequency distribution of all user response times following the final stage of our enhancement process, a point at which "average" user response time was 11.6 seconds.

As can readily be seen, 11.6 seconds is a distortion of the true picture. In reality, fully 50% of user response times are two seconds or less. It is only the long tail of the heavily skewed distribution that creates the 11.6-second "average." Keeping our example in mind, we can now hypothesize how we could create the picture we are seeing in figures 2 and 8 without really having affected think time. We must simply

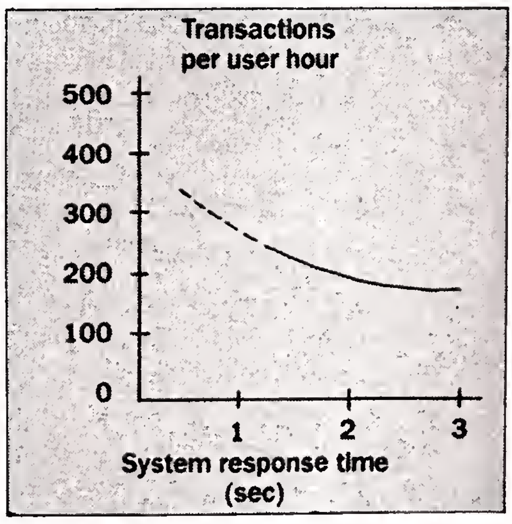


Figure 7. Relationship between system response time and transactions (remote).

Series is here. Spread the word.

In 1980, IBM introduced the Displaywriter System. Today, it's become the best-selling stand-alone text processor in the world. One reason for this success is the Displaywriter's function-rich software.

If you're looking for software like that, but working on an IBM personal computer, you don't have to look any further. Because the IBM DisplayWrite Series is here.

And it will put many of the features and capabilities of a dedicated word processor to work for you when you're writing.

It runs in the family.

You'll find two word processing programs in this series: There's DisplayWrite 1, for IBM personal computers—including PC*jr.* And DisplayWrite 2, with added functions for your PC, PC/XT or *Portable* PC.

You'll also find DisplayWrite Legal, a dictionary of about 16,000 words that a lawyer might need to check.

And you'll find DisplayComm, which lets your IBM PC send and receive text to and from other IBM PCs. If you're writing at the office, this program could also let you send text to an IBM Displaywriter down the hall. (From there, it could be sent on to an IBM host computer for distribution.)

Some words on high function.

The DisplayWrite word processing programs give you the time-saving features you'd expect from IBM. Justified margins, centered lines and pagination, for example. You'll even have prompts and messages to help guide you along.

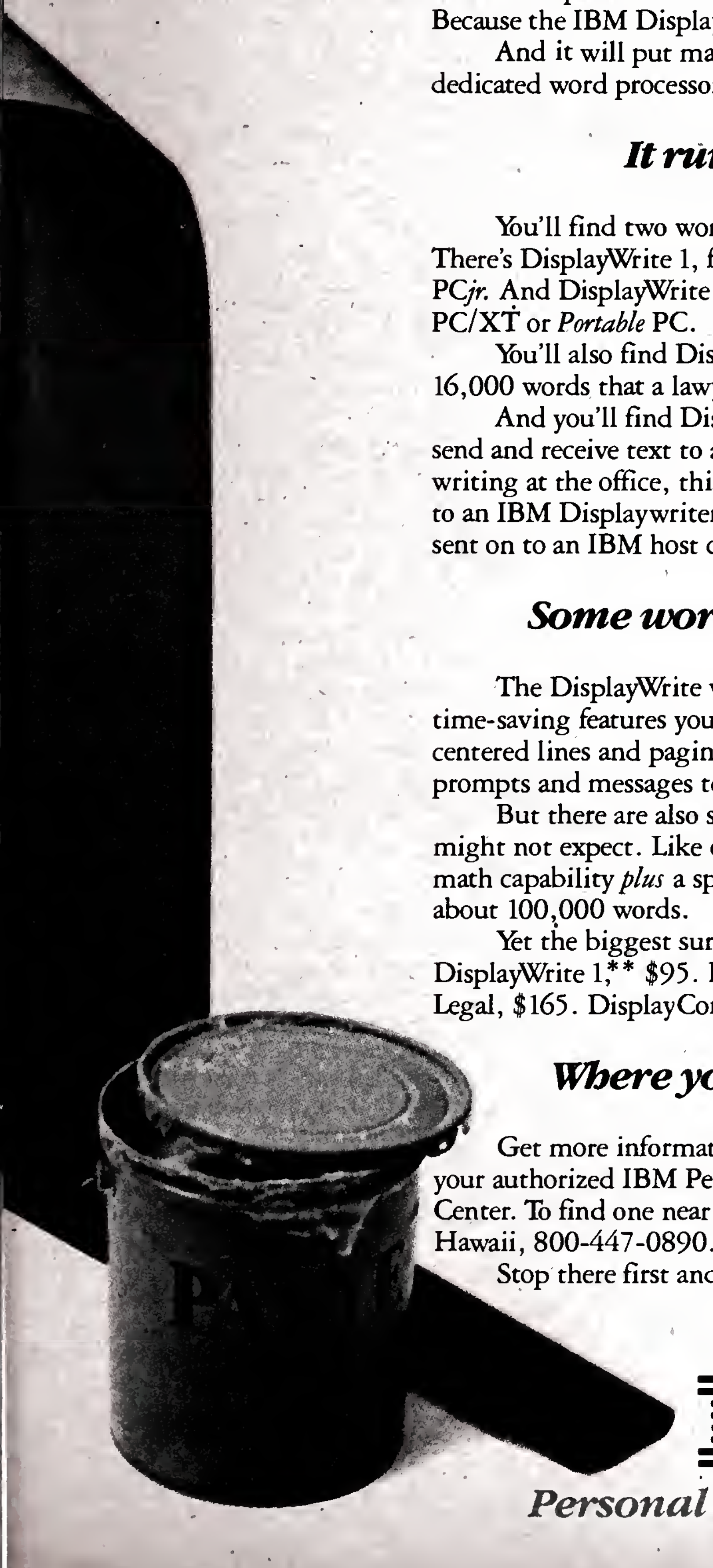
But there are also some features in DisplayWrite 2 you might not expect. Like easy column formatting, four-function math capability *plus* a spelling checker based on a dictionary of about 100,000 words.

Yet the biggest surprise of all may be the price.* DisplayWrite 1,** $95. DisplayWrite 2, $299. DisplayWrite Legal, $165. DisplayComm, $375.

Where you can find all four.

Get more information about the IBM DisplayWrite Series at your authorized IBM Personal Computer dealer or IBM Product Center. To find one near you, call 800-447-4700. In Alaska or Hawaii, 800-447-0890.

Stop there first and get the last word.



IBM®

Personal Computer Software

increase the relative percentage of whatever those transactions are that require "minimal" think time. Could that have happened? The answer is yes, and it did.

As we continued our investigation of the raw data comprising the 15-minute intervals, we found that 55% of the transactions after stage 4 were single-key entries on the part of the user. In addition, 50% of these one-character commands averaged only 0.6 seconds of user think time. Going back to the start of our study, our base data indicated only 32% of the commands had consisted of a single character. This percentage had "grown" over the six-month period with each system enhancement to its current level.

Note: This change is not at all evident when looking at only 15-minute averages. In fact, I still don't know why the systems programmer who had gathered all the study data had bothered with inbound character stream information. Whatever the reason, I am indebted to him. Other studies I am aware of (and ours initially) had concentrated on resource consumption as an indicator of changing patterns. That seemed logical to me, but now as I review the data, I begin to wonder if there is any basis at all for saying that what is trivial to the system is trivial to the user, or, for that matter, if what is complex to the system is complex to the user.

My case with the applications development manager was now a little suspect. If work patterns had changed as a result of the improved system and network response time such that users were substituting trivial commands (from their perspective, one-character commands with no thought required) for what previously were complex commands (multiple-key with thought), then both the increased transaction rates and the reduced think time illusion were not only explainable but, more important, not meaningful indicators of productivity.

If the real productivity gain was little more than the value of the reduced response time, then, when spread over an entire workday, it would amount to an imperceptible gain of only 3% to 4%. Actually, the explanation isn't quite this simple, but it does represent the gist of the argument. The next section will offer more insight into some of the psychological aspects of rapid response time as we analyze new evidence in greater detail.

Short-term memory

Short-term memory (hereafter referred to as STM) is temporary, active and conscious. It is what we often refer to as our attention span. Its temporary nature is such that information will disappear from STM in 10 to 20 seconds if not mentally repeated. As such, decay is one reason for loss of information from STM, but note that decay still takes at least 10 seconds.

Within the range of response times we are looking at, decay then does not seem to be an issue. The next thought is not lost, and the individual does not have to reconstruct it as theorized by Doherty and Kelisky. Another reason for loss of information in STM is interference. Interference theory holds that either new information can interfere with old (retroactive inhibition) or old can interfere with new (proactive inhibition). However, the degree of interference is a function of similarity in the old and new information. The more similarity there is, the more interference there is likely to be.

If the real productivity gain was little more than the value of the reduced response time, then, when spread over an entire workday, it would amount to an imperceptible gain of only 3% to 4%.

Distractions are more likely to cause information loss through decay than through interference, but only if the distraction occupies an individual for a relatively long period (10 seconds or more). In any event, I believe the more logical explanation for the reduction in user response time is the observable one, modification of behavior, rather than short-term memory loss.

In one regard, I agree wholeheartedly with Doherty and Kelisky and that is in their contention that "the traditional model of a person thinking after each system response appears to be inaccurate."

Instead, there are a great number of user interactions with the system in which the only component of the user time is his ability to react. We have already seen this with one-character transactions.

In studying the modal value of user response times as the number of keys hit moved from two to 10, we saw that the user's time was a direct reflection of keying speed, approximating the equivalent of 30 to 40 words per minute. This meant that the user "knew" what he was going to do next and needed only to enter the appropriate data once the system had responded. However, there were many times, at all levels of system response, when the user clearly did not know what his next step would be. It is these occasions that lead to many of the user response times on the tail of our frequency distribution.

These do not mean, however, that the user had to rethink his next step because of slow response and

You name it. Chances are we can service it.

More than 4,500 service experts across the country are ready to fix your equipment. Almost any make, model or type there is.

Western Union Field Service is one of the largest, best qualified service teams in the nation. And we're ready to install and maintain everything from complete networks and communicating systems to individual CRTs, microcomputers and printers.

What's more, we're fast. With over 350 strategic locations, we cover every state in the Union, and can be anywhere you need us in a hurry.

To find out about service contracts, or just get more information about what we can do for your brands, call toll-free 800-222-0885 (in New Jersey 201-934-0200). Telex us at 642-474. Or send your business card to Tom Quinn, Vice President, Western Union Field Service, One Lake Street, Upper Saddle River, NJ 07458.

Western Union Field Service.
Nationwide, single-source service.

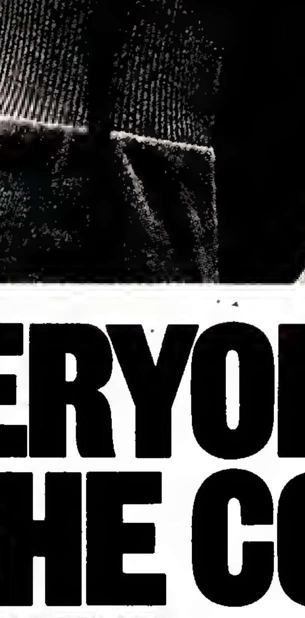
EVERYONE WHO WANTS TO USE THE COMPANY MAINFRAME RAISE YOUR HAND.

Introducing power to the people.

Better known as the Data Pipeline™ from Intel.

It's based on our iDIS™ Database Information System. A powerful, integrated package of hardware and software with multi-user capability built right in. And now, through iDIS, just about any pc or terminal can easily share data with just about any mainframe.

With the iDIS Pipeline, you'll be able to establish and manage your pc-to-mainframe connections in a way never before possible. Yet you'll still be able to offer department users a fair degree of independence. Since iDIS comes with all the software they need. Starting with the Xenix* operating system, built around a relational DBMS. Plus the Multiplan* spreadsheet, word processing, electronic mail, and a forms/menu development tool.



Our Data Pipeline™ allows practically any pc to share data with practically any mainframe.

The iDIS Pipeline is powerful, too. Each one will handle 5 full-time users, or between 12 and 15 on dial-up. And you can even network with other iDIS systems. But you're always in control. You decide which data are accessible, and extract only those to your iDIS system. Users then access their data sets from iDIS's hard disk.

Actually, using the iDIS Pipeline is a lot like giving users their own little mainframe.

Which is a lot better than giving them yours.

It's also a lot cheaper.

Less than half the cost of a direct pc-to-mainframe connection.

It's also fully supported and serviced from one responsive source. Us. Best of all, it's available now.

For more information about how our iDIS Data Pipeline can help you manage the revolution in your office, call us at 800-538-1876; in California, 800-672-1833. Or write Intel, Lit. Dept. H-18, 3065 Bowers Ave., Santa Clara, CA 95051.

Of course, if you're undecided about what to do you can always ask for a show of hands...

intel®

***According to the Gartner Group, who took the time to figure out all the hidden costs, each direct pc-to-mainframe connection costs approximately $22,000. Each. *Xenix and Multiplan are trademarks of Microsoft Corporation.* *© 1984 Intel Corporation.*

Stage	Transaction rate	Network and system response time	User response time
0	196	2.5	15.9
1	225	1.3	14.7
2	238	1.1	14.0
3	257	0.8	13.2
4	290	0.6	11.6

Figure 8. Results of efforts to improve response time.

memory decay. They might simply mean that what the user did next could only be determined after he had a chance to review the system's reply to his previous command. This is somewhat logical as we consider the development process and is supported by the data in Figure 10, which depicts the percent of user response times over three seconds as a function of the previous system response when the next user command is only a single character.

There is not a clear pattern here, nor would I expect there to be one (other than a relatively flat line which might appear with more data). It does indicate, however, that in some percentage of interactions, user response is totally independent of system response and that there is a thought process that takes place after the system has replied. Some might want to argue that this chart indicates that 25% to 30% of the time the user's thought process is interrupted, but that argument leads nowhere. If that was the case, all the chart would demonstrate is that the probability of the user being interrupted is also independent of system response.

I would like now to comment on the change in user behavior as demonstrated by the increase in one-character transactions. It is my feeling that, indeed, users have substituted many simple transactions for a few complex ones, thus lowering the "average" think time. But isn't it possible they are more productive in the process? It is true that an individual will adapt to his environment and, in adapting, he will select a strategy that he perceives as optimal.

The problem here is the one of user perception. It would be nice to think that what is perceived as optimal is, in fact, optimal, but there is no psychological basis I am aware of for saying that. What is perceived as optimal may be less productive if the perception is only based on the psychological reinforcement the user is receiving from rapid system response. I am, for lack of any substantial proof one way or the other, assuming the two wash. However, I feel it is important that this phenomenon be researched thoroughly, because it could have significant impact (possibly adverse) on the value of subsecond response time.

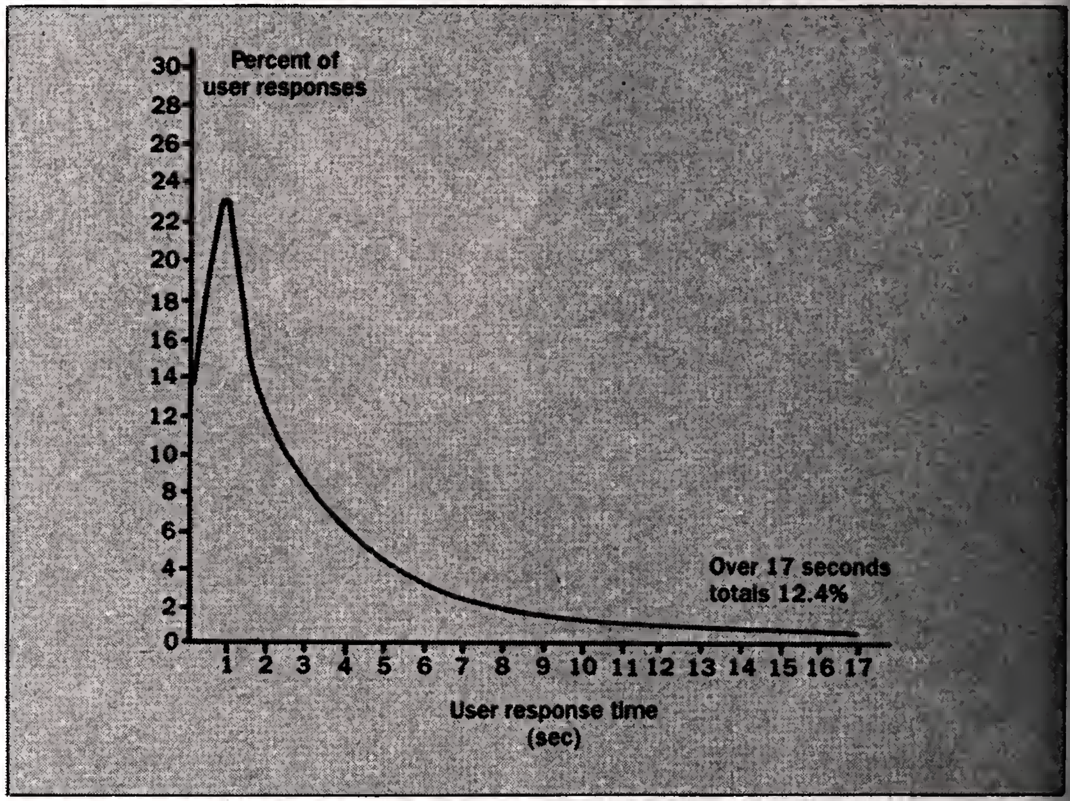


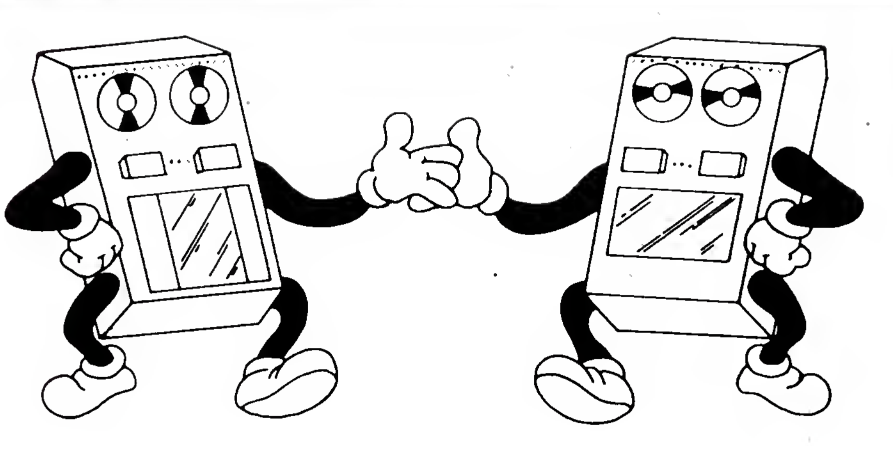
Figure 9. Frequency distribution of user response time.

As mentioned earlier, the substitution theory is not a complete explanation of the transaction-rate and think-time phenomena. Our studies indicated that you could, in fact, influence an individual's reaction time as response time was lowered, though only slightly. In measuring reaction time for one-character transactions as a function of system response, we produced the plot in Figure 11. At all levels of system response, 50% of the transactions were used, that percentage which was clearly nothing more than a reaction to a stimulus. It appears that several tenths of a second can be gained as response time approaches zero.

Though this result does not produce a significant benefit in an applications development environment (300 transactions per hour times 0.3 seconds = 1.5 minutes), it is certainly of value in high-volume environments (graphics image manipulation) where transaction rates can exceed several thousand per hour through a combination of reduced system time and reduced reaction time.

It is also interesting to note that with very quick response time (0.2

OUR SWITCHES MAKE YOUR IBM* SYSTEMS WORK LIKE A TEAM!



If you have more than one IBM or plug compatible processor, Digital can help you get the most for your hardware investment. Our switches allow you to achieve backup and peripheral configuration flexibility at a fraction of the cost you're probably thinking.

Whether you have two processors or more, Digital has a switch to suit your requirements.

- Model 4101 The lowest priced matrix switch on the market.
- Model 3421 The only manually operated channel switch in the industry.
- Model 3403 A remote controlled channel switch designed for underfloor installation.

DIGITAL CONTROLS

2779 Orchard Run Road • Dayton, Ohio 45449 U.S.A. • (513) 435-5455
Dallas 214-669-0089 New York 201-585-9416

*Registered Trademark

Business system analysts, designers, and programmers...

Does your system-development method help you:

- spend only a fraction of your time collecting information on the old system?
- cut down on paperwork that no one else ever looks at?
- make the right decisions about how to organize files and programs so you save hours (or days or months) of reprogramming?
- produce 5000 lines of tested code per month?
- create systems that are easy to maintain...and that need less maintenance?
- go easily and quickly from analysis to design to implementation?

If not, get your 30-day free trial copy of a book called *How to Design and Develop Business Systems*. It must show you practical ways to improve system development in your shop, or send it back and forget the bill...no questions asked.

Trainers:

Now you can get 2 products that make it easy to use *How to Design and Develop Business Systems* for training.

The *Case Studies* book contains 4 projects that are based on actual businesses. These projects not only make your trainees practice the methods in the text. They also give your trainees confidence that the methods really do make system development more manageable.

The *Instructor's Guide*'s main purpose is to give solutions to the case studies. But it also has objectives for each chapter of the text, form masters, and transparency masters of *all* the text illustrations.

If you need a complete, practical system-development course that's guaranteed to work or your money back, take a look at these materials TODAY.

To get your 30-day FREE trial copies,

☎ call **toll-free 1-800-221-5528** In California, call 1-800-221-5527

Or Mail the coupon below

Mike Murach & Associates, Inc., 4222 West Alamos, Suite 101, Fresno, CA 93711 SD4/1

Yes, Mike, I want to improve system development in my shop. Send me the books I've marked below for a FREE, 30-day trial. I must be satisfied, or I'll send them back and forget the bill...no questions asked.

_____ **How to Design and Develop Business Systems, $20** _____ **Instructor's Guide, $35**
_____ **Case Studies, $6**

☐ Bill me for the books plus shipping and handling (and sales tax in California).

☐ I want to **SAVE** shipping/handling charges. Here's my check or money order for full payment. Same return privilege with full refund guaranteed. California residents, please add 6% sales tax to your total. (Offer valid in U.S.)

Name and title ______________________
Company (if any) ______________________
Address ______________________
City, State, Zip ______________________

IF YOU CAN IMAGINE IT...

GCH
Z

CYBER CAN RUN IT

Introducing CYBER 180 computer systems from Control Data.

The computer systems built with the future in mind.

Our CYBER 180s represent a significant advance in applications capability. A complete family of mainframe computers, the CYBER 180 systems are all fully compatible, one with the other. They have been designed with one overriding thought in mind: to offer computer systems able to handle applications well into the 1990s and beyond.

The CYBER 180s can handle a broad variety of jobs quickly and efficiently, from VLSI chip design to PLATO® computer-based training. Through our unique architecture, it is possible to run two operating systems simultaneously — our current Network Operating System (NOS), and our new virtual system, NOS/VE. This dual architecture makes it easy to develop new applications on the CYBER 180s — and to transport applications from other systems.

The protection of hardware and software investments is another hallmark of the CYBER 180s. From our 64-bit word Supermini 810 to the large scale Model 990, these systems offer a 1-to-60 performance range — the largest compatible growth path in the industry. And through a unique combination of hardware and software features, the CYBER 180s provide complete system security — with no drain on performance. Of course, the CYBER 180s are fully supported by Control Data's training, maintenance and consulting services.

CYBER 180s. Their uses are limited only by the imagination.

Automation, process control and submersible technology are combined in a single application for mining ore deposits on the edge of the continental shelf.

3

CYBER CAN RUN IT

CYBER power begins where other systems reach their limits.

To transcend the limitations of ordinary computers, Control Data offers six separate models; three of these can be enhanced by adding a second CPU. So no matter what number of terminals or response times are required, there is a CYBER 180 that fits the need.

As a result, there is ample provision for system migration within the CYBER family—without the cost of converting to a new system. We've made provisions for the future in other ways as well. Our NOS/VE is a logical extension of the NOS operating system. It delivers significant extensions to the NOS environment, like virtual memory and eight-bit characters. By doing so, it increases the extendability of the CYBER 180 systems, ensuring that they will be able to handle increasingly complex applications and emerging software languages.

But perhaps best of all, entry into the world of CYBER power can be achieved today—and at a surprisingly low cost. The Supermini 810 is available for as little as $250,000, complete with peripherals and software. Our 64-bit word Supermini 810 provides applications capabilities simply not possible with other minicomputers. And, of course, our customers can upgrade through the entire family of CYBER 180 systems.

CYBER 180s. The choice for system growth.

Combining helium with the lift of a continually-rotating spherical airfoil, lighter-than-air vehicles show increased maneuverability and stability over conventionally-shaped dirigibles.

SOLARI
ARIZONA

CYBER CAN RUN IT

Application engines from Control Data.

With power and flexibility enough to handle applications from oil field simulations to global weather predictions, student records to CAD/CAM, the CYBER 180s can best be described as application engines. Not only are the CYBER 180s designed to perform a wide range of tasks, but they also have the power and capacity to deliver application solutions well into the future.

Control Data designed the NOS operating system, and the still more advanced NOS/VE, to be readily accessible to all users, no matter what their level of experience. High performance features like large real memory, exceptionally large virtual address space, and system security that's built into the architecture make NOS/VE a highly attractive vehicle for application users and developers. And with NOS/VE it's easy to transport applications from other systems.

The wealth of applications already available — or in development — for the CYBER 180s is impressive. They include programs in mechanical and electronics design, petroleum exploration, education and construction. There is also, of course, our PLATO® computer-based training — with custom courseware that meets specific training needs, as well as a library that includes hundreds of hours in subjects as diverse as robotics and exploration geophysics.

One more point: Control Data has taken an active role in ensuring a continued flow of new applications for the CYBER 180s. Our Software Vendor Program, for example, brings together Control Data's resources and independent application developers to design and implement applications for use on the CYBER 180 computer systems.

CYBER 180s. For today and tomorrow.

Cityscape in alternative resources: solar, wind and geothermal technologies are applied to maximize energy efficiency. Solar panels form windprops which rotate parallel to desert surface; temperatures of air and water supplies are maintained by flows through buried conduits.

NOW ACCEPTING YOUR APPLICATIONS

The CYBER 180s are much more than a new family of mainframe computers. They encompass a whole family of peripherals, software languages, application programs, security features and much more.

We have prepared a series of brochures designed to explain in greater detail the features and functions of the CYBER 180 family:

☐ CYBER 180 Systems Overview
☐ Supermini Overview
☐ NOS Overview
☐ NOS/VE Overview
☐ Security
☐ VX/VE (UNIX* System)
☐ Processors
☐ Models 835, 845, 855
☐ Model 990
☐ Information Management
☐ Terminals Overview
☐ Distributed Communications Network
☐ Peripherals Overview
☐ Systems Architecture

To find out more about the CYBER 180 computer systems, contact your local Control Data representative and ask for any of these brochures. Or write: Computer Systems Marketing, Control Data Corporation, P.O. Box 0, HQW09G, Minneapolis, MN 55440.

Outside the United States, contact your local Control Data sales office or write: Computer Systems, Control Data Corporation, International Operations, 7600 France Avenue South, ITL05F, Minneapolis, Minnesota 55435 USA.

*Trademark of Bell Laboratories

CONTROL DATA

Addressing society's major unmet needs as profitable business opportunities.

If Lambert achieved a 58% increase in productivity, then much of that was due to environmental factors and individual terminals. Though changing the environment may not be a readily available option, providing developers with their own terminals is, in today's world, viable and relatively inexpensive.

seconds or less), user reaction times are approaching their physiological limit. The fastest a person can react to a visual stimulus that requires hand or finger movement as a response is 0.2 seconds. More typical would be 0.25 seconds. It simply takes that long for the various body components to perform the task, from the rods and cones in the eye, to the optic nerve, to the brain, to the efferent neurons that carry the message to the hand.

Therefore, from a purely physical standpoint, I can't conceive of much more than another tenth of a second, if that, being gained even if we were given virtually instantaneous system response.

Interpreting findings

If the real value of subsecond response time in an applications development environment is little more than the value of the time gained in system response, then how can one explain the findings of other studies? The Lambert study is a case in point ("A comparative study of system response time on program developer productivity," *IBM Systems Journal* 23, No. 1, 1984). That study indicated that user productivity as measured by transaction rates increased 62% as response time dropped from 2.23 seconds to 0.84 seconds. This part we can now readily understand.

However, Lambert went on to demonstrate that work output, as measured by deliverable product, also showed a 58% increase in productivity. What would explain that if not the response time improvement? As Lambert points out, each member of the study group was given his own terminal. The control group shared terminals. Also the study group was relocated to a quieter environment. Lambert's findings then, I believe, are a combination of all of these elements (individual terminals, response time, environment) plus the Hawthorne effect, which, though Lambert strove to avoid it, certainly seems to be a factor.

Nevertheless, I am encouraged by his findings. If Lambert achieved a 58% increase in productivity, then much of that was due to environmental factors and individual terminals. Though changing the environment may not be a readily available option, providing developers with their own terminals is, in today's world, viable and relatively inexpensive.

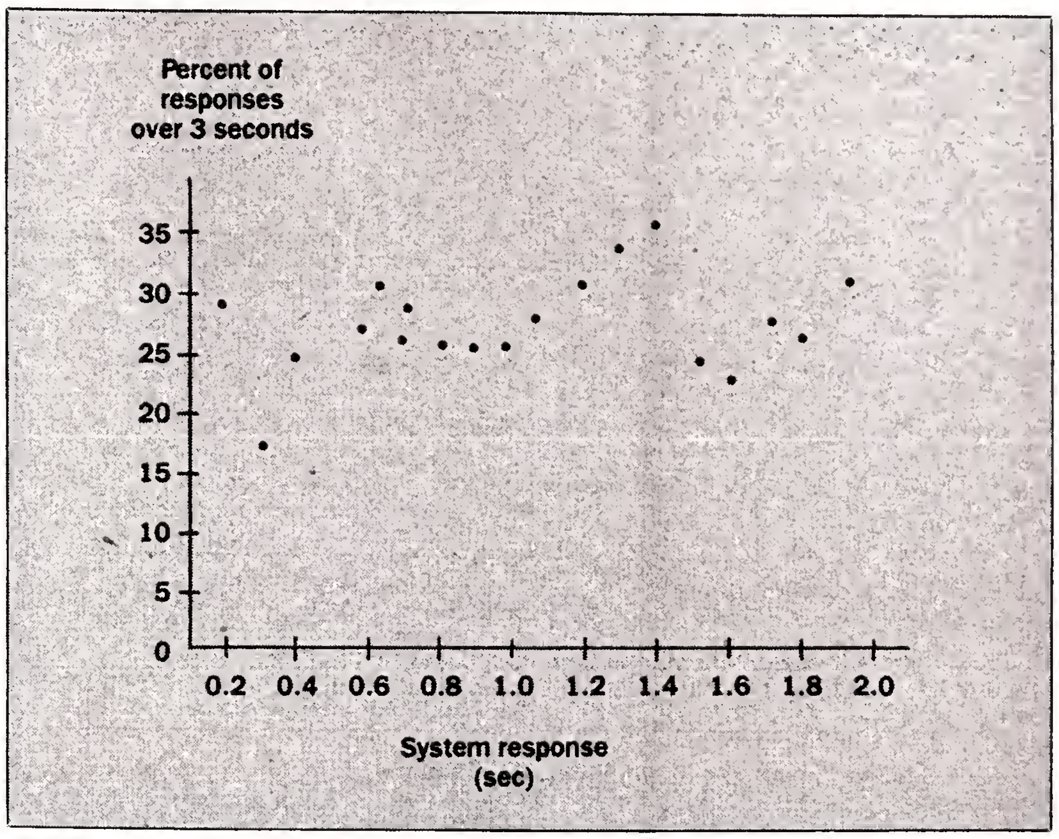


Figure 10. Single-character transactions.

Lambert also noticed increased terminal usage to cover on-line pseudocode and documentation. I concur that this can lead to increased productivity (and quality), but the benefit seems to be derived more from the immediate access to a terminal than from subsecond response time. I am interested in pursuing this in our environment.

Further investigation

People with whom I have shared the contents of this paper have been, for the most part, supportive and encouraging. I have encountered some resistance, but no rebuttal of substance, within IBM, and I appreciate their permission to excerpt their publications. Conversations with Arvind Thadhani have not led to either one of us modifying our views. Therefore, as I summarize my conclusions, I do so with the hope that others will find them of enough merit to initiate detailed studies of their own and lend their support to one explanation or another.

My conclusions are as follows:

1. As system response time is improved in an applications development environment, there is a change in user behavior resulting in a greater percentage of reaction-time-only commands.

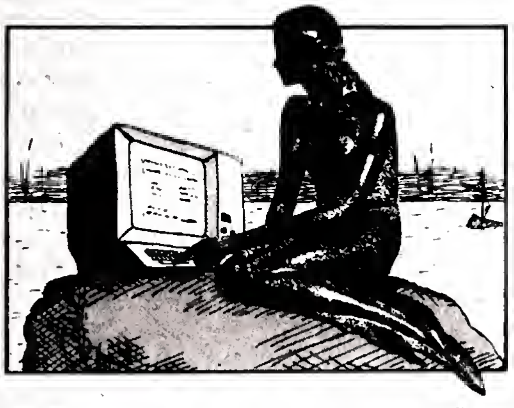
2. This change in behavior, combined with the real savings associated with the reduced system response time and a slight improvement in user reaction time, produces the unusually high transaction rates generally observed and creates the illusion of a significant reduction in user "think" time.

3. Short-term memory decay does not seem to be a major contributing factor to terminal productivity.

4. There is a direct correlation between user reaction time and system response time. As response time approaches zero, reaction time approaches its physiological limits. This savings can be several tenths of a second.

5. It appears that individuals can

Reach the Danish computer market with Computerworld/ Denmark.



The Danish EDP market is growing at an incredible rate of 23% annually. Last year, this market was valued at more than $185 million. And the U.S. is Denmark's major supplier of EDP products accounting for 40% of the country's computer equipment imports.

When Danish computer professionals with purchasing power want the most up-to-date local and international information on the EDP industry, they read *Computerworld/Denmark*, sister publication to *Computerworld*. *Computerworld/Denmark* is a bi-weekly newspaper serving the Danish computer community with the latest developments in hardware, software, terminals and other computer products and services. And, in every issue, the MicroWorld section reports on the special needs of the micro end-user and the status of the market.

So, if you'd like to market your products or services internationally, *Computerworld/ Denmark* has a circulation of 20,000 computer professionals who would like to hear from you.

CW International Marketing Services will give you one-stop advertising service in countries around the world. We will translate your ad and bill you in U.S. dollars. For more information on *Computerworld/Denmark* or any of our other foreign publications, just fill out the coupon below.

Diana La Muraglia, Manager
International Marketing Services
CW Communications/Inc.
375 Cochituate Road, Box 880
Framingham, MA 01701
(617) 879-0700

CW COMMUNICATIONS/INC.
Publishers of *Computerworld* and other leading computer publications around the world.

Please send me more information on
☐ *Computerworld/Denmark* ☐ Your other foreign publications
Name ____
Title ____
Company ____
Address ____
City ____ State ____ Zip ____

REVOLUTIONARY SPREADSHEET/CALCULATOR

- Ultra Easy to Use
- Spreadsheet Combined with Pocket Calculator Capabilities
- Powerful Features Only Found in $2000-$3000 Products
- Financial Functions: NPV, IROR, . . .
- Math Functions: Log, sine, . . .
- Powerful "What If" Capability
- Great for Office and Also School Work
- Requires Only 128K, IBM PC or PC/XT
- Menu and/or Command Driven, Help Function

Introducing . . . COMPUTE™
Special Offer . . . $129

Mail to: **Blaha Software, Inc.**, Suite 803, 50 Commonwealth Avenue, Boston, MA 02116.

Name ____ Amt. Enclosed ____
Street ____
City/State/Zip ____

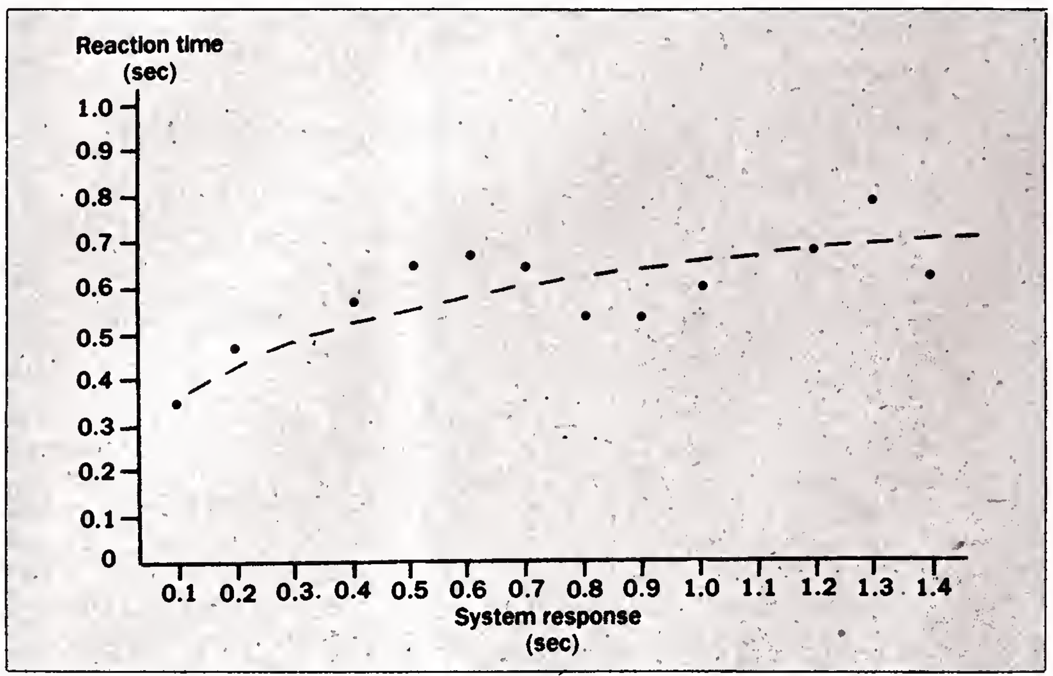


Figure 11. Reaction time as a function of various levels of system response

and do react to extremely quick response times. This fact, combined with the improved reaction time, can produce significant productivity gains in reaction-oriented environments.

6. Behavioral changes are the result of an individual's adaptation to the environment and his perception of an optimal strategy.

These changes do not necessarily result in increased productivity.

7. Individual terminals and, possibly, the environment may be much more important to productivity gains in an applications development environment than subsecond response time.

However, if the productivity gains are the result of a synergistic effect (the whole is greater than the sum of the parts), then all components may be of relatively equal importance in that they work to enhance one another.

Current, future research

The following topics are some I believe warrant further investigation in light of new evidence. Research in these areas should lead us to a better understanding of the psychology of the man-computer interface.

The list is certainly not all-inclusive. In fact, just recently in a conversation with B. Pope (IBM, New York) I became aware of some excellent research being done on the psychology of individual usage patterns. However, the list does contain those questions that came to mind as I was developing this article.

1. Are behavioral changes associated with quick response noted in environments (other than applications development) where users have the option of selecting from alternative strategies?

2. What, if any, is the correlation between a user's perception of an optimal strategy and actual productivity?

3. What is the practical limit to which reaction times can be pushed? What bearing does this limit have on the definition of optimal (in terms of cost-effective) system response?

4. In "conditioning" an individual to react more quickly, which component is the most important: subsecond response or consistent response? Or are both required?

5. How are reaction times affected at higher levels of system response? Above 1.5 seconds, does reaction time stabilize, as it appears it might, or does it continue to deteriorate?

(This question is of academic interest only.)

6. How much do the environment and individual terminals contribute to increased productivity? Or must their effect be evaluated only in the context of the synergism created with subsecond response time?

In closing, one comment. I do not purport to be an expert in either the area of subsecond response time or psychology. Nor do I mean to convey that my conclusions concerning the subject are the final word. Our measurements have not been subjected to any rigid statistical validation, nor can I guarantee their complete accuracy. However, they are findings that raise serious questions.

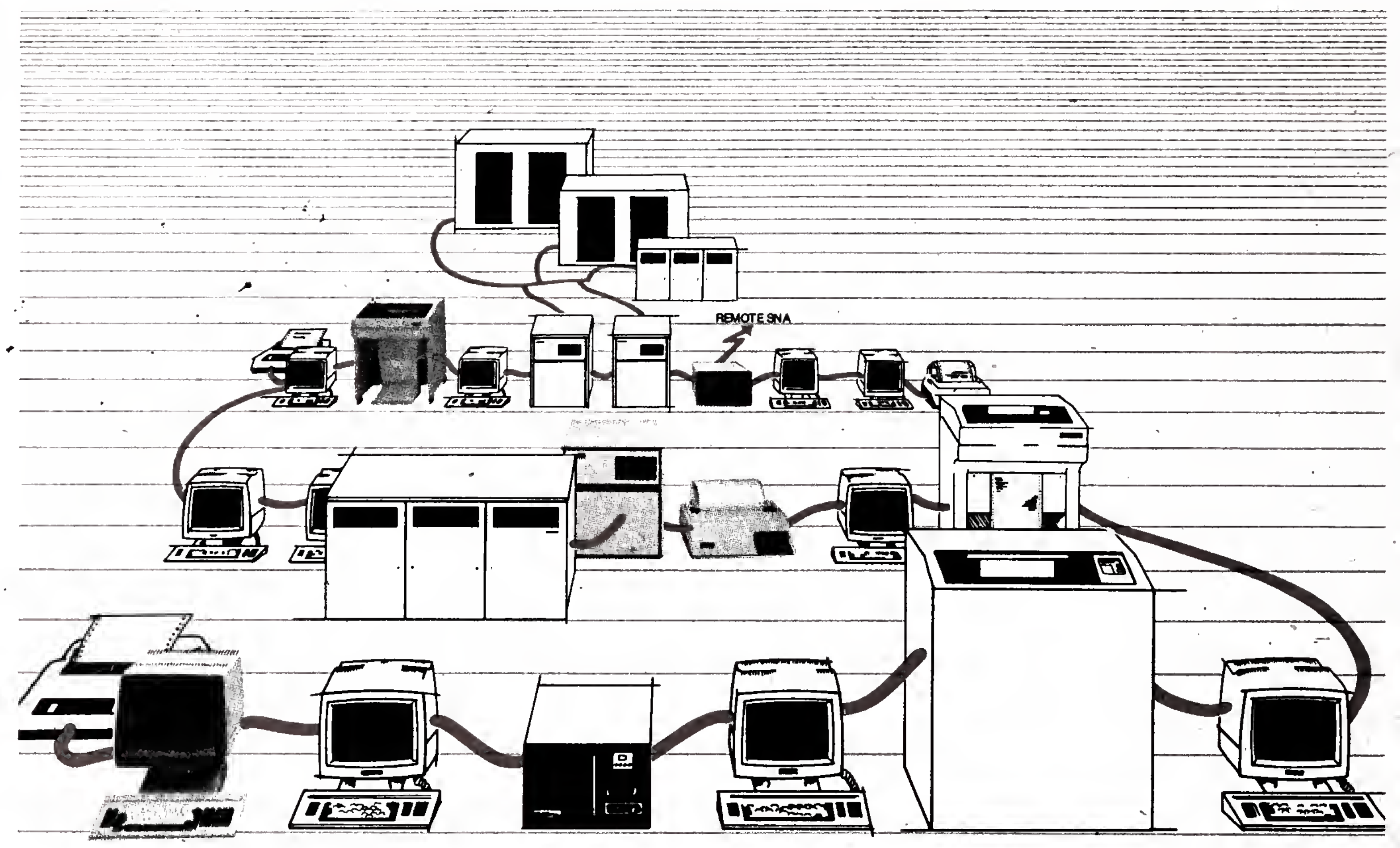
The charts and figures generally found in presentations or literature on the value of subsecond response create an impression not necessarily supported by the underlying data. The fact that they have such appeal (addressing the most costly component of applications development, personnel) has resulted in willing acceptance and many jumping on the (big blue) bandwagon.

It would seem that at the very minimum these examples, if not dropped completely, should be accompanied by the appropriate disclaimers and caveats.

About the author

Lawrence Kosmatka is manager of computer operations at Wisconsin Electric Power Co. in Milwaukee. He has been in DP for 17 years.

Kosmatka has been studying psychology at Marquette University, coincident with conducting these studies.



3270 Networking: No More No Man's LAN.

Imagine. 3270 Processing. Integrated Personal Computing.
Local Area Networking. And SNA Compatibility. In One System.

Imagine a system that successfully settles the uncharted territory of 3270 local networking—that "no man's LAN" of unlinked and unrealized potential.

Imagine a system that delivers the power of 3270 processing, and the flexibility to build two local area networks from a single controller. Imagine being able to attach up to 120 devices to that controller. Or attaching four distinct controllers—and multiple coaxial links of up to 10,000 feet each—to any of those LANs.

Imagine the economies of a system that handles that networking with standard 3270 coax. That requires no commitment to special architectures or non-standard LAN technologies. And that, thanks to a multi-drop, station-to-station design, can eliminate thousands of feet of new coax.

Of course, such a system would have SNA compatibility. But it would also have a set of capabilities to dramatically increase throughput, while reducing hardware and support cost in *any* environment. Capabilities like multi-host and multi-personality support, application and address switching, and system printing.

This system would have multi-user personal computing "built into" the network—allowing you to assign true 16-bit computing power, maintain overall MIS control and share expensive disks and printers.

Such a system would boast an intelligent display station that displays a mastery of ergonomic and aesthetic design. With multi-screen formats, anti-glare screen, low-profile keyboard, and a tilt-and-swivel pedestal with the smallest footprint in the industry. Such a system would also include a full line of printers.

Imagine. 3270 processing. IBM-compatible personal computing. Versatile, economical, powerful local area networking. In one system.

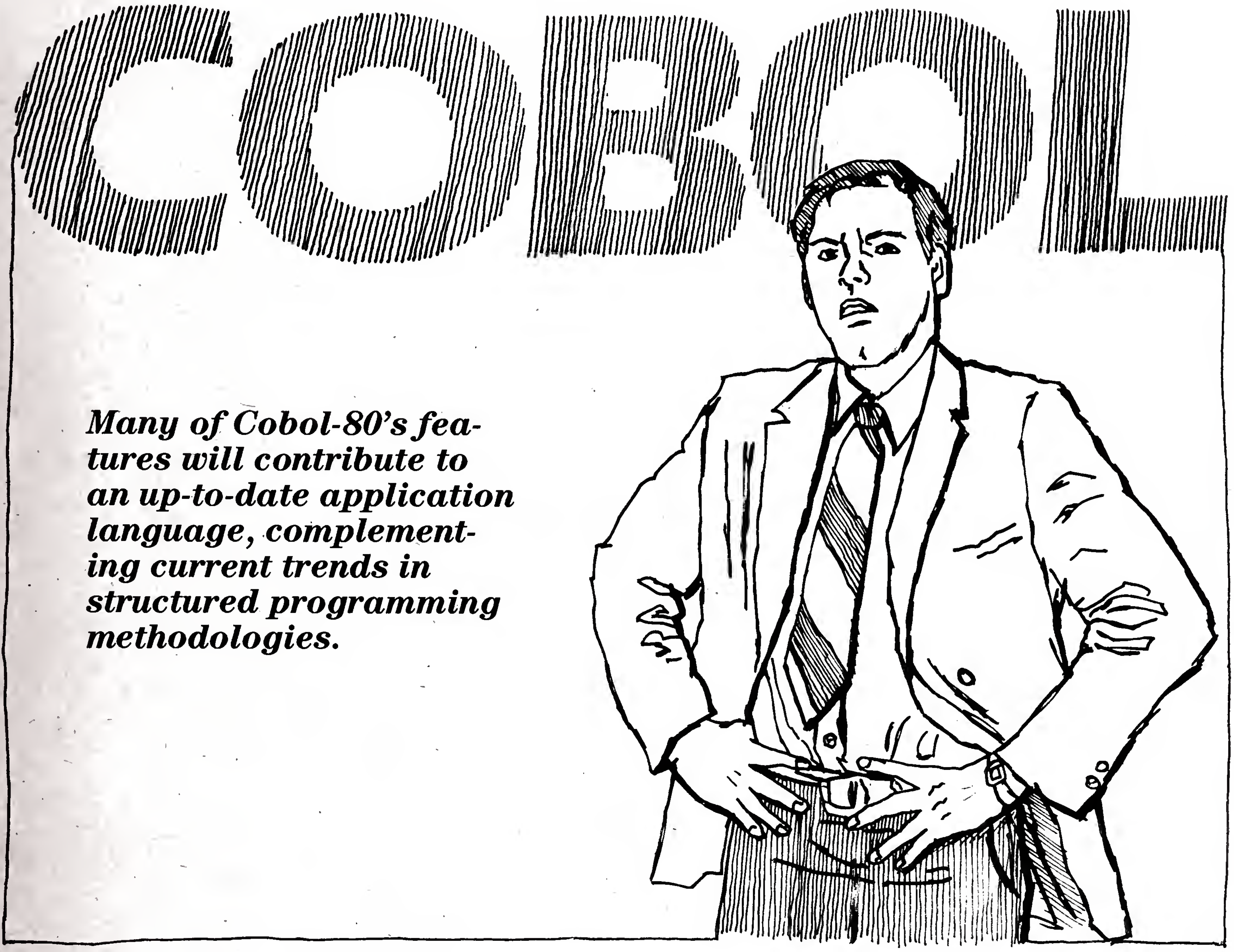
Braegen *has* imagined just such a system. They have designed it. Built it. And called it the ELAN™ System.

If such a system sparks your imagination, give us a call. We know the feeling. The Braegen Corporation, 525 Los Coches Street, Milpitas, CA 95035
(408) 945-8150; TWX: 910-338-7332

Braegen's Way Works Better

BRÆGEN

™ÉLAN is a trademark of The Braegen Corporation.



Many of Cobol-80's features will contribute to an up-to-date application language, complementing current trends in structured programming methodologies.

In defense of Cobol

By Jerome Garfunkel

The use of Cobol cripples the mind; its teaching should, therefore, be regarded as a criminal offense.

— E.W. Dijkstra, May 1982

It is rather unlikely that Cobol will be around by the end of this decade.

— Anonymous, June 1960

Critics have been predicting Cobol's death for at least 24 of its 25 years. But while they pronounced Cobol archaic, the language continued to evolve. Cobol's combination of excellent file and data handling capabilities, procedural clarity and ability to link easily to other subsystems is unique in business application languages. Certainly this combination has contributed to Cobol's being the most widely used business application language in existence.

Cobol has frequently been blamed for system inadequacies when in fact the fault lies more often in poor systems design than in an inadequate programming language. Its significance in the growth of business data processing generally has been vastly underestimated, as the following statement in the article "Cobol, your age is showing" [CW, May 14] suggests: "[Over the past 25 years] Cobol's net influence on data processing progress has been negative."

This statement is wrong in light of the history of business data processing during the last quarter century. Furthermore, the new American National Standard (ANS) Cobol-80 language due shortly is yet another giant step in Cobol's evolution.

While it is true that the original Codasyl Cobol meeting at the Pentagon in 1959 was only a "short-term" committee, the history of the Codasyl committees that eventually evolved clearly shows that Cobol became a long-term project early in its development. The work of the present Codasyl Cobol Committee (along with the American National Standards Cobol Committee, the International Standards Cobol Committee and many other Cobol committees around the world) is a testament to Cobol's relevance to the data processing industry.

It is wrong to conclude that Cobol is a useless maintenance tool. Only when Cobol (as any other application language) is used improperly does it become useless or fall short of its potential as a maintenance tool. The new Cobol-80 language addresses this area of programming specifically.

Cobol-80 reflects state-of-the-art programming techniques. Further, many features that are not included in the new ANS Cobol-80 have been defined by the Codasyl Cobol Committee in

Name	Class	Arguments	Comments
ACOS	N	N1	Arccosine of N1
ANNUITY	N	N1, N2	Ratio or annuity paid for N2 periods to investments at interest of N1
ASIN	N	N1	Arcsine of N1
ATAN	N	N1	Arctangent of N1
CHAR	X	N1	Character in position N1 of program collating sequence
COS	N	N1	Cosine of N1
CURRENT-DATE	X	—	Current date and time, and difference from Greenwich Mean Time
FACTORIAL	I	I1	Factorial of I1
INTEGER	I	N1	Integer part of N1
LN	N	N1	Natural logarithm of N1
LOG	N	N1	Logarithm to base I0 of N1
LOWER-CASE	X	X1 or A1	All letters in X1 or A1 set lower-case
MAX	ARG	Z1,....	Value of maximum argument
MIN	ARG	Z1,....	Value of minimum argument
MOD	I	I1, I2	I1 modulo I2
NUMVAL	N	X1	Numeric vlaue of simple numeric string
NUMVAL-C	N	X1, X2	Numeric value of numeric string with optional commas and currency sign
NUMVAL-F	N	X1	Numeric value of floating-point string
ORD	I	X1	Ordinal of X1 in collating sequence
ORD-MAX	I	Z1,...	Ordinal of maximum argument
ORD-MIN	I	Z1,...	Ordinal of minimum argument
RANDOM	N	N1	Random number
SIN	N	N1	Sine of N1
SQRT	N	N1	Square root of N1
TAN	N	N1	Tangent of N1
UPPER-CASE	X	X1 or A1	All letters in X1 or A1 set upper-case
WHEN-COMPILED	X	—	Date and time program was compiled

Figure 1

```
EVALUATE   AGE-OF-DEBT   ALSO   CREDIT-RATING
     WHEN  0 THRU 30      ALSO  "A" THRU "B"  PERFORM NO-NOTICE
     WHEN  0 THRU 30      ALSO      "C"       PERFORM MILD-NOTICE
     WHEN  31 THRU 60     ALSO      "A"       PERFORM MILD-NOTICE
     WHEN  31 THRU 60     ALSO      "B"       PERFORM NORMAL-NOTICE
     WHEN  31 THRU 60     ALSO      "C"       PERFORM FIRM-NOTICE
     WHEN  61 THRU 90     ALSO      "A"       PERFORM NORMAL-NOTICE
     WHEN  61 THRU 90     ALSO      "B"       PERFORM FIRM-NOTICE
     WHEN  61 THRU 90     ALSO      "C"       PERFORM COLLECTIONS
     WHEN  91 THRU 999    ALSO      "A"       PERFORM FIRM-NOTICE
     WHEN  91 THRU 999    ALSO  "B" THRU "C"  PERFORM COLLECTIONS
END-EVALUATE
```

Figure 2

```
PERFORM WITH TEST AFTER UNTIL X = 100
   ADD 1 TO X
   MOVE TABLE-ITEM (X) TO TABLE-ITEM (X + 1)
END-PERFORM
```

Figure 3

its "experimental" Cobol model. Specifically, the inclusion of intrinsic functions (see Figure 1) and the VALIDATE statement (a reversed report writer facility) is a clear answer to Cobol critics who claim that the language is becoming out of date.

These intrinsic functions as well as the VALIDATE statement (described in *Computerworld*, Nov. 7, 1983) are included in the Codasyl Cobol Committee's *Journal of Development* (JOD). The Cobol JOD represents a model version of Cobol from which the American National Standards Institute Cobol Committee (X3J4) selects features for standardization and general distribution to the computing public.

The real problem with Cobol is not the inadequacies of the language, but rather the perception of its inadequacies by some in the computing community. For years, academicians have been critical of Cobol on principle — so much so that many college data processing syllabuses include little or no instruction in Cobol. They choose to ignore its legitimate place in the real business world.

Corporate DP managers have known of this problem for some time. Hiring a computer science major out of college for an application programming position often requires beginning his training with elementary Cobol programming.

Also hampering the development of Cobol as an up-to-date programming language and perhaps more serious than any other obstacle are the reactions from a significant segment of the DP community that is resistant to change (regardless of how beneficial that change may be).

The latest efforts to block the new ANS Cobol-80 are led by a well-meaning but shortsighted group of managers who, rather than learn to manage improving technology, choose to reject that technology so as not to have to deal with it. For them, a programming language is "good enough" if it fills current application needs, however minimally. They fail to measure lost productivity resulting from not using a more modern, powerful Cobol programming language. They also fail to measure the deferred maintenance costs that result from shortsighted or quick solutions to problems they must live with for years to come.

These critics think that Cobol should be nearly "frozen" or no longer enhanced. To them, a new Cobol verb is merely a new reserved word rather than a new tool for increased productivity.

Under pressure from some Cobol critics who claim that Cobol is evolving too quickly, these features, VALIDATE and intrinsic functions, along with other very useful features have been rejected for inclusion in the new Cobol-80 and have been put off for further consideration until perhaps 1994.

Structured environments

The most significant development in software engineering over the past two decades has been the introduction and acceptance of structured methodologies. Other critics of Cobol have argued that Cobol is difficult to use at installations that apply structured methods for their systems development. Perhaps there was once some truth to this claim, but certainly it no longer holds true after Cobol-80.

During the mid-1970s, the Codasyl Cobol Committee held a symposium to collect comments and suggestions from leading software engineers around the world. The aim was to make Cobol a compatible application language in structured environments. This symposium resulted in a major updating of the Cobol language and the world has the benefits of those efforts in the new Cobol-80.

Many of the new features of Cobol-80 will greatly ease the use of Cobol in structured programming en-

½ MB Removeable Memory!

Looking at compact memory options for your next design? Consider the proven technology of Braemar's CM-600 digital mini-cassette drive.

- Up to ½-megabyte capacity per 80-ft. tape
- Tolerates wide temperature variations and mechanical shock — far more rugged than alternate storage methods
- Requires only one voltage source at low current

Over 100,000 Braemar minicassette drives are in operation today, handling new memory for instrumentation, process control, medical electronics, portable terminals, word processing and archival storage tasks.

Take advantage of a low-cost data storage method that has been proven in demanding industrial applications. Save your data and your budget with the CM-600 from Braemar Computer Devices.

$125
in quantity

BRAEMAR
COMPUTER
CORPORATION
11950 TWELFTH AVENUE SOUTH / BURNSVILLE,
MINNESOTA 55337 / 612 890 5135 TELEX 882 169

Introducing the world's first complete, self-contained, 16-bit portable computer system.

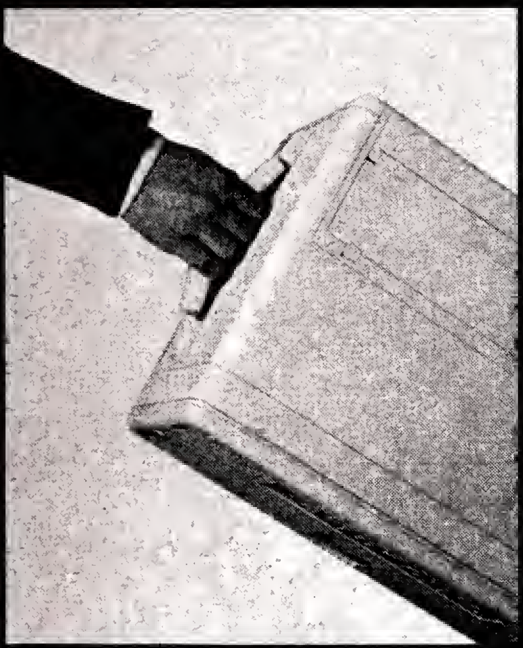
The Panasonic® Sr. Partner with a built-in printer.

The Panasonic Sr. Partner is one of the most flexible and versatile portable computers on the market today. So there are many reasons to buy one.

Runs IBM PC Compatible Programs.

To begin with, the Sr. Partner runs IBM PC compatible programs. So you can pick from hundreds of popular programs from an existing software library. Including Lotus® 1-2-3,® Multiplan® and even Flight Simulator.®

In addition, included with the Sr. Partner are five of the most respected business-related programs including VisiCalc,® WordStar,® PFS® Graph, File and Report plus G.W. BASIC®* All at no extra charge.



This "bundle" allows you to go to work immediately doing word processing, electronic spread sheets, file management, graph development and your own programming.

And because it also accepts IBM PC compatible hardware, the Sr. Partner's technical capabilities can be expanded even further.

Built-in Printer.

The Sr. Partner is the only portable in its class with a built-in printer. It has graphics capability and can provide you or your customers with printouts of statistics, budget figures, conference notes, graphs and much, much more.

The printer is also extremely quiet and offers an 80-character line and the 132-character line that's perfect for spread sheets and other accounting programs. And its bi-directional logic design delivers fast printing.

A Complete System.

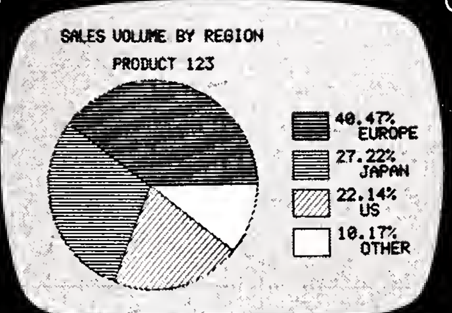
The Sr. Partner is an integrated system that doesn't require costly add-ons to be called complete.

It has 128K internal memory (RAM), expandable to 512K. A nine-inch, high-resolution CRT with monochrome screen. An 8088 microprocessor with a MS-DOS™ 2.11 operating system. An 8087 co-processor socket. A built-in, double-sided, double density, 360K, 5¼-inch disc drive and the capability of handling another one just like it. Built-in color and graphics at no extra cost. An option slot for IBM hardware. An RGB monitor output. A centronics parallel interface I/O port that accepts optional peripherals. And an RS-232 serial interface I/O port. All for a price that's surprisingly affordable.

The Sr. Partner is also backed up by a 12-month limited warranty. Most of the competition offers only 90 days.

And if the Sr. Partner should ever need servicing, we have a national network of authorized service dealers.

Over 60 Years of Dependability.



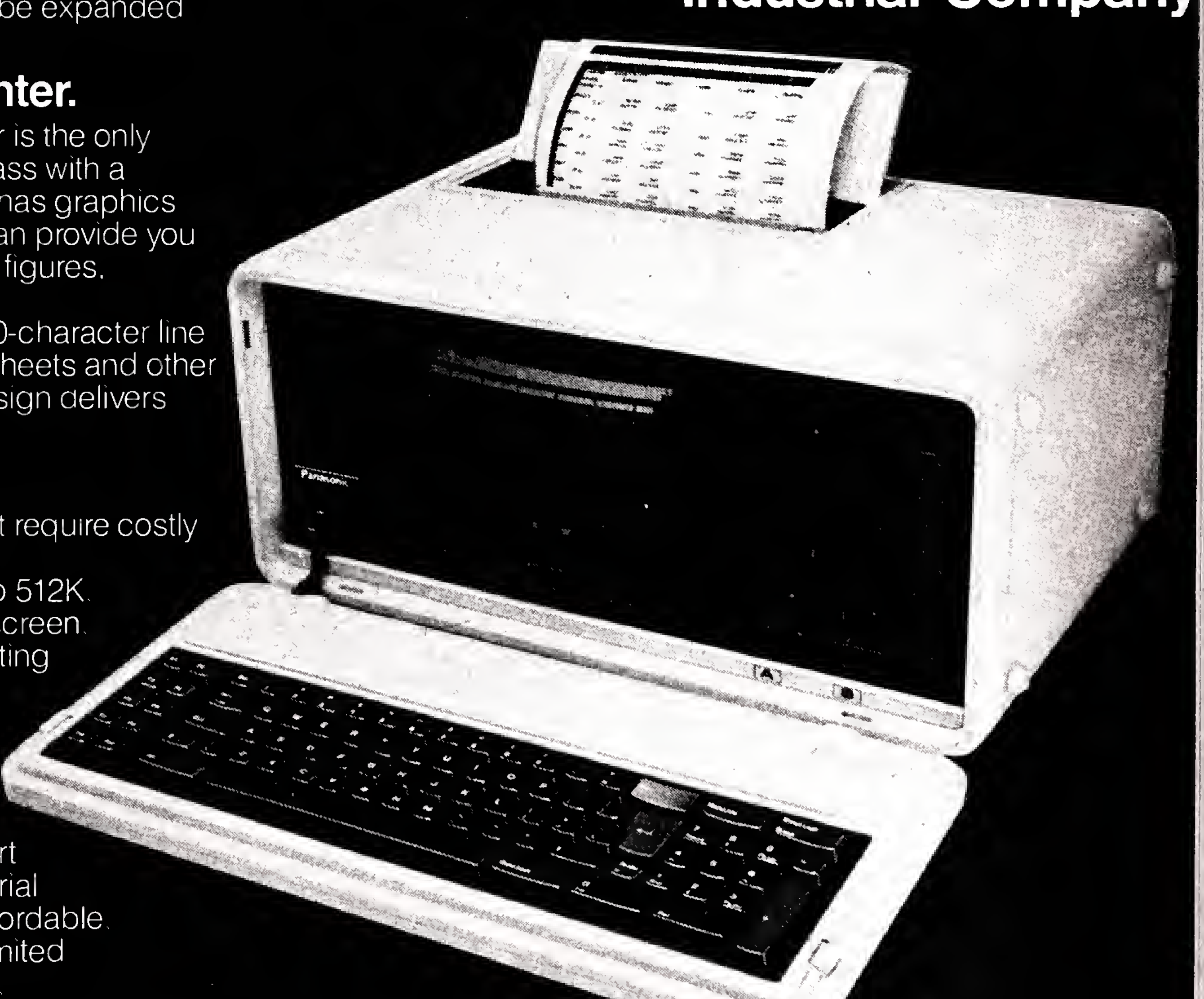
We're not one of those "here today, gone tomorrow" companies. Our parent, Matsushita Electric Industrial Co., has been in business since 1918 and is one of the world's largest consumer electronics manufacturers.

Matsushita's recent contributions and innovations to computer and office technology include: a data entry system that directly connects facsimile data to a computer. An online optical character reader. A "pocket terminal" telephone data entry system. And a 64K static memory chip.

For more information about the Sr. Partner, write to: Computer Department, Panasonic Industrial Company, Division of Matsushita Electric Corporation of America, One Panasonic Way, Secaucus, NJ 07094. Or call: (201) 392-4261.

The Panasonic Sr. Partner. It's everything you've always needed in a portable computer but never had before.

Panasonic®
Industrial Company



---

*Software package subject to change

Registered Trademarks: WordStar — MicroPro International Corporation; PFS — Software Publishing Corporation; 1-2-3 and Lotus — Lotus Development Corporation; VisiCalc — Visicorp; Flight Simulator, G.W. BASIC and Multiplan — Microsoft

```
IF      FINAL-RECORD-PROCESSED
THEN    PERFORM        LAST-TRANSACTION-PROCEDURE
        READ           BATCH-KEY-FILE
          AT END       EXIT PROGRAM
        END-READ
        IF             BATCH-KEY = "D"
          THEN         PERFORM DELETION-PROCEDURE
          ELSE         PERFORM MODIFY-PROCEDURE
        END-IF
ELSE    PERFORM NORMAL-RECORD-PROCEDURE
        CONTINUE
END-IF
```

Figure 4

```
01 SCREEN-PAGE.
            03 NAME             PIC X(20).
            03 TELEPHONE        PIC 999B999B9999.
            03 BALANCE-DUE      PIC 9999V99.
            03 CUST-STATUS      PIC A.
```

Figure 5

vironments. Some of the new features specifically useful in structured programs are the following:

EVALUATE. The EVALUATE verb provides a means of testing multiple conditions and specifying multiple control branches (Figure 2).

PERFORM. An in-line version of the PERFORM statement is now permitted. In addition, "DO-while" and "DO-until" constructs can now be written with the addition of the WITH TEST BEFORE and WITH TEST AFTER clauses (Figure 3).

Note the relational operator GREATER THAN OR EQUAL and the new relative subscript (X + 1).

Structured conditional statements. With the inclusion of 19 scope terminators (END-IF, END-READ, END-ADD and so on), constructs of nested conditional statements may be written with clarity (Figure 4).

False condition branch. To add structured symmetry to all conditional clauses (AT END, ON SIZE ERROR and so on), a negative version of the clause is also allowed as in:

```
READ            MASTER-FILE
  AT END        EXIT PROGRAM
  NOT AT END    PERFORM PROCESS-RECORD
END-READ
```

Nested programs. Complete programs may be wholly contained within other programs, allowing structured systems to be developed, tested and maintained more effectively. It also allows for the outside program to specify GLOBAL data items, which may be shared by any of the contained (inside) programs. As in this example:

```
01 SHARED-DATA IS GLOBAL PIC X(20).
```

In addition, GLOBAL USE procedures may be specified in the declarative section of the outer program, which allows for file error processing in the contained programs to be centralized and controlled by the outer (master) program. As in this example:

```
USE GLOBAL AFTER STANDARD ERROR
PROCEDURE ON INPUT.
```

CALL. Data items that are passed to "subprograms" may protect their contents from being modified by the addition of the BY CONTENT phrase of the CALL statement:

```
CALL PAYROLL USING BY CONTENT
WEEKLY-PAY, YTD-PAY.
```

Initializing subprograms. When the PROGRAM-ID of a subprogram contains the phrase IS INITIAL after its program name, the programmer can be assured that all data values will be initialized before it starts executing.

```
PROGRAM-ID. ACCOUNTS-PAYABLE IS
INITIAL.
```

OCCURS-VALUES and subscripts. Seven dimensions (seven levels of subscripting) may now be specified (previously only three levels were provided); also initial values may now be specified for table elements without the need to REDEFINE the table.

```
01.
   03 TABLE-ELEMENT PIC 999V99
   OCCURS 100 TIMES VALUE ZERO.
```

Symbolic characters. The symbolic character clause in the SPECIAL-NAMES paragraph provides a means for a programmer to specify a user-defined name for nonprintable characters in the Ascii (or other) character sets.

```
SYMBOLIC CHARACTER BELL IS 8 IN ASCII
```

In this example, 8 refers to the eighth ordered character in the Ascii character set, and BELL is a user-defined figurative constant.

FILLER. The word FILLER is optional and is no longer restricted to elementary data items.

```
01.
   02 COUNTER-1 PIC 999V99.
   02           PIC X.
   02 COUNTER-2 PIC 999V99.
```

De-editing. Numeric-edited data items (PIC $$$,$$$) may be moved to purely numeric data items (PIC 9(6)V99). Using the two PICTURE clauses just mentioned, for example, results in moving a data item that contains $1,234 to a data item containing, after the move, 00123400.

SORT. Multiple output files are permitted. In addition, the WITH DUPLICATES IN ORDER clause now

$8295 converted to $3768

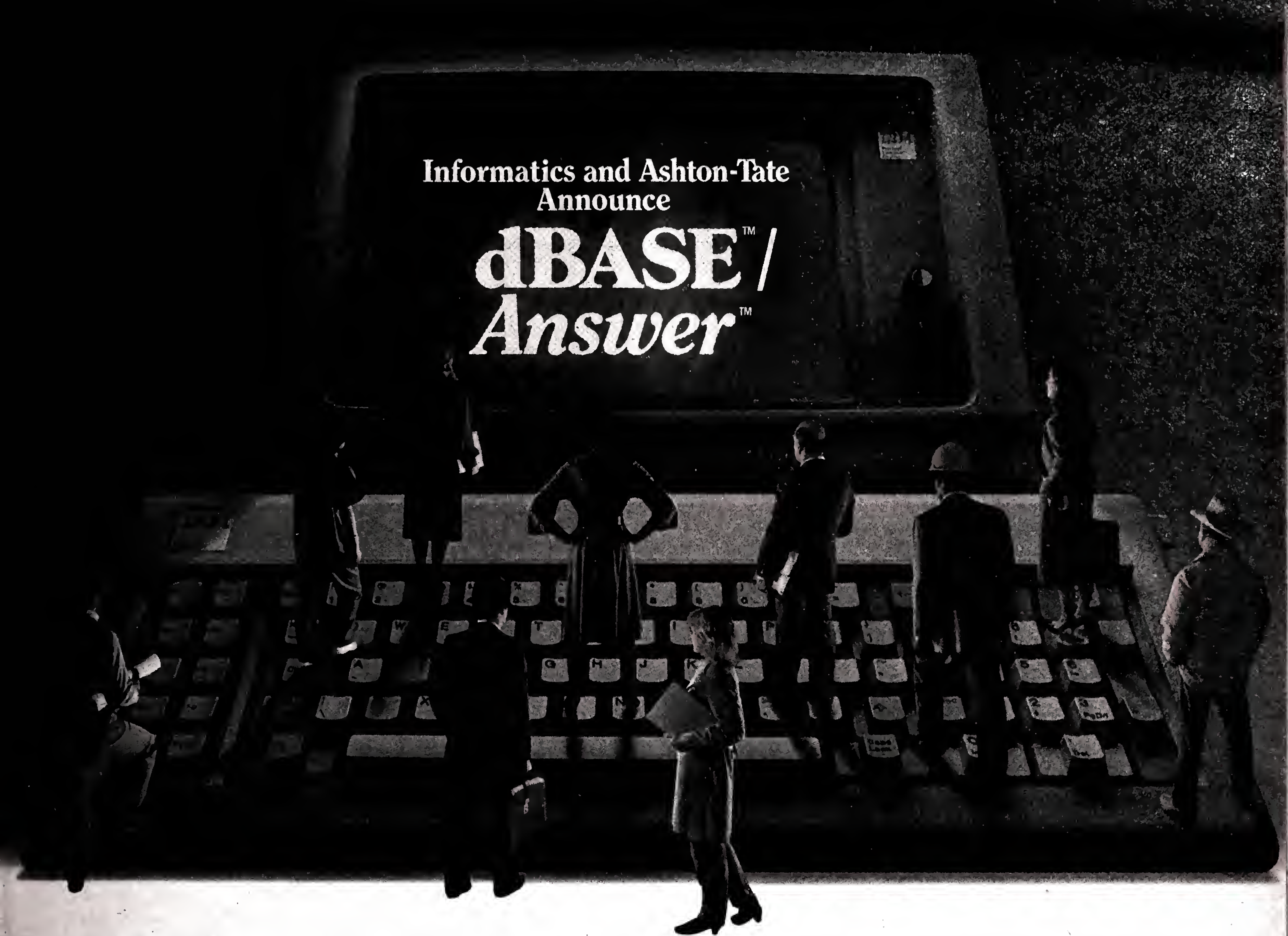
Still the most reliable protocol converter.
Now the best priced protocol converter.

The Kaufman 87X. For support of eight ASCII devices, that's only $471 a line. That makes the 87X the most cost-effective converter on the market. And it's also available with four or six ports.

You'll also find the 87X easy to upgrade with its modular design. Plus, it's compatible with IBM Bisync or SNA, and Sperry Uniscope.

Find out more about the Kaufman 87X.
Call or write Marketing Department,
Kaufman Data Communications, Inc.
415/962-8811

KAUFMAN
DATA COMMUNICATIONS, INC.
An Orange Nassau Electronics Company
145 East Dana Street
Mountain View, CA 94041-1573
415/962-8811 TWX: 910/379-5021



Introducing dBASE™/*Answer*™—the first micro-mainframe link that allows PC users to use mainframe data while taking full advantage of all Ashton-Tate's dBASE,™ FRIDAY!™ and FRAMEWORK™ software.

Finally, your end users can get the most from your corporate micros.

Informatics General and Ashton-Tate have joined forces to create a micro-mainframe link which works with Ashton-Tate's best-selling software.

This all-new dBASE/*Answer* system is the next logical step in the corporate use of micros. That's because it delivers end users more capabilities than ever before, including:

- **Universal Access** to IMS, IDMS, TOTAL, ADABASE, VSAM and virtually all other database management systems which operate on IBM mainframes.
- **Complete Support** for all dBASE, FRIDAY!, and FRAMEWORK software systems. Now end users can download information for database management, reporting, and distributed application development and use.
- **Ease of Use,** so even novice end users can get more information from their micro computers. All they have to do is select options (assisted by prompting) and dBASE/*Answer* handles mainframe interface and data delivery. The user receives completely formatted files, ready for use with dBASE, FRIDAY!, and FRAMEWORK software systems.

In addition to all the end user benefits with dBASE/*Answer*, Data Processing professionals also get:

- **Security** at the micro, mainframe, database *and* content level. dBASE/*Answer*'s unique password and user profile capabilities allow you to limit the information each end user can access.
- **Control** over system resources. Using dBASE/*Answer*'s request classification capabilities, your data processing department can provide immediate *or* deferred response to end user requests.
- **Selectivity** through dBASE/*Answer*'s qualification logic ability. It allows end users to select and qualify the data they want—and you to deliver only the data they need.

Get the facts on dBASE/*Answer* and receive a *free* Demonstration Diskette.

dBASE/*Answer* from Informatics can actually help you get your money's-worth from your company's investment in micro computers. And the easy way to see for yourself is by using the *free* Demonstration Diskette in your own micro computer.

To reserve your free dBASE/*Answer* Demonstration Diskette, mail this coupon today or call toll free

1 800 227-3800 Ext. 911

(In Canada, call collect 416-488-7192)

informatics general corporation™

THE SOFTWARE ENGINEERS

dBASE, FRIDAY!, and FRAMEWORK are Trademarks of Ashton-Tate. *Answer* is a U.S. Registered Trademark of Informatics General Corp. IBM and the IBM Logo are Registered Trademarks of International Business Machines Corp.

FREE dBASE/*Answer* DEMONSTRATION DISKETTE REQUEST

☐ **YES.** I want to know how dBASE/*Answer* can help me get the most from my company's micros. Please contact me to deliver a free Demonstration Diskette without cost or obligation.

☐ I'd like more information on dBASE/*Answer*. Please see that I get the full details, without cost or obligation.

Your Name__________

Title__________

Company Name__________

Phone No.__________ (Incl. Area Code)

Address__________

City__________ State__________ Zip__________

Mail to: Informatics Free dBASE/*Answer* Information
P.O. Box 1452, Canoga Park, CA 91304

CW-BU

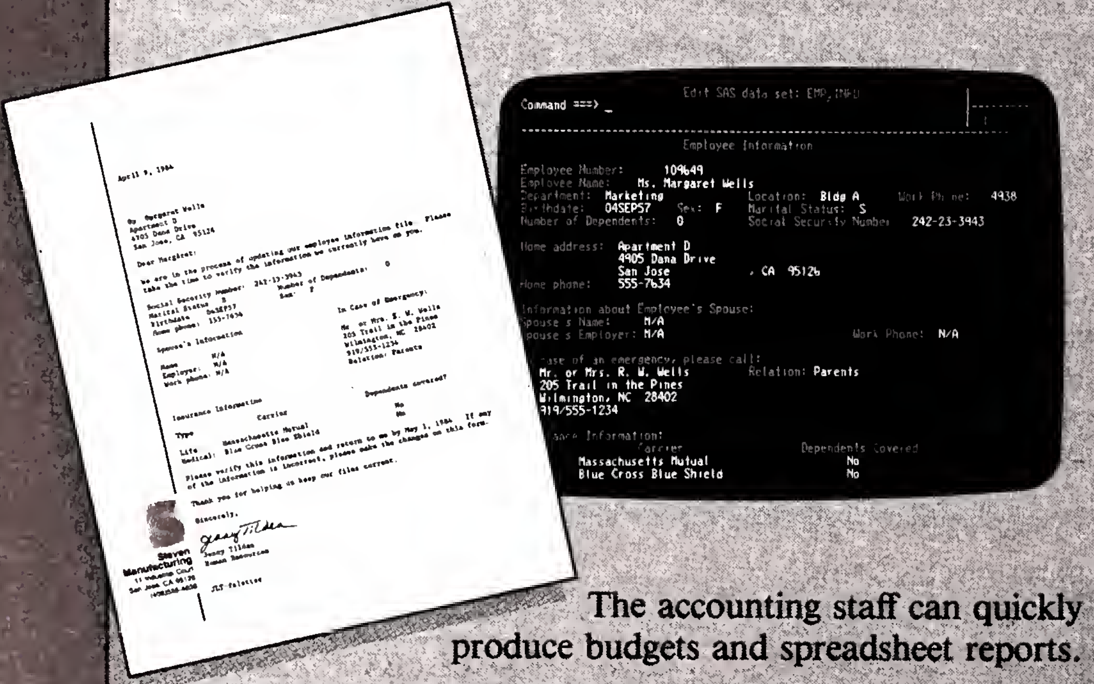
The SAS System. . .

Are your users demanding faster service and more business expertise than your data processing staff can offer? Is your DP staff demanding relief from its applications backlog? Is your management demanding lower development and maintenance costs? Put the SAS® System in your Information Center and you can meet all these demands.

> **“The SAS System is the one, completely integrated software solution to meet your Information Center needs.”**

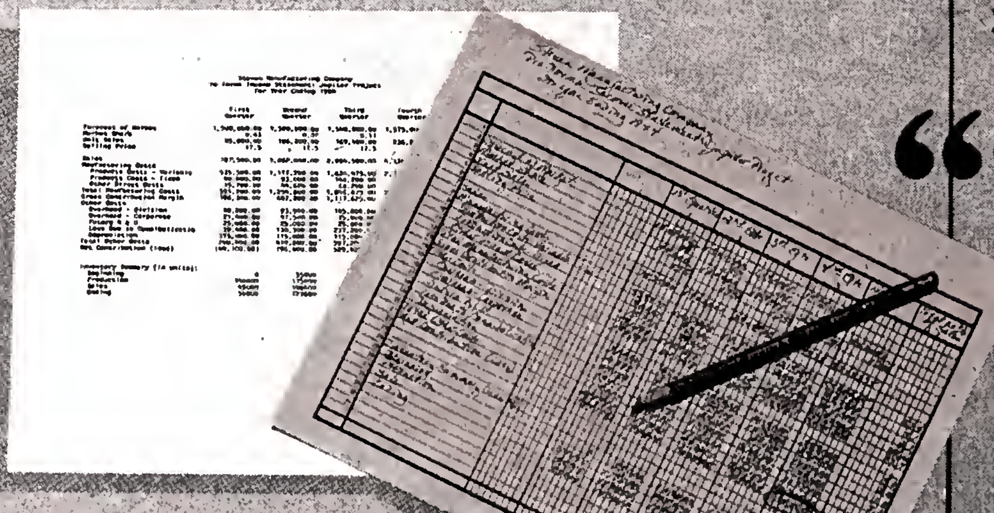
The SAS Solution for End Users

Your marketing staff can use the base SAS® product for sales reports and analyses. Sales representatives can use the full-screen capabilities in our SAS/FSP® product to manage their prospect files and the personnel department can keep track of employee and applicant records.

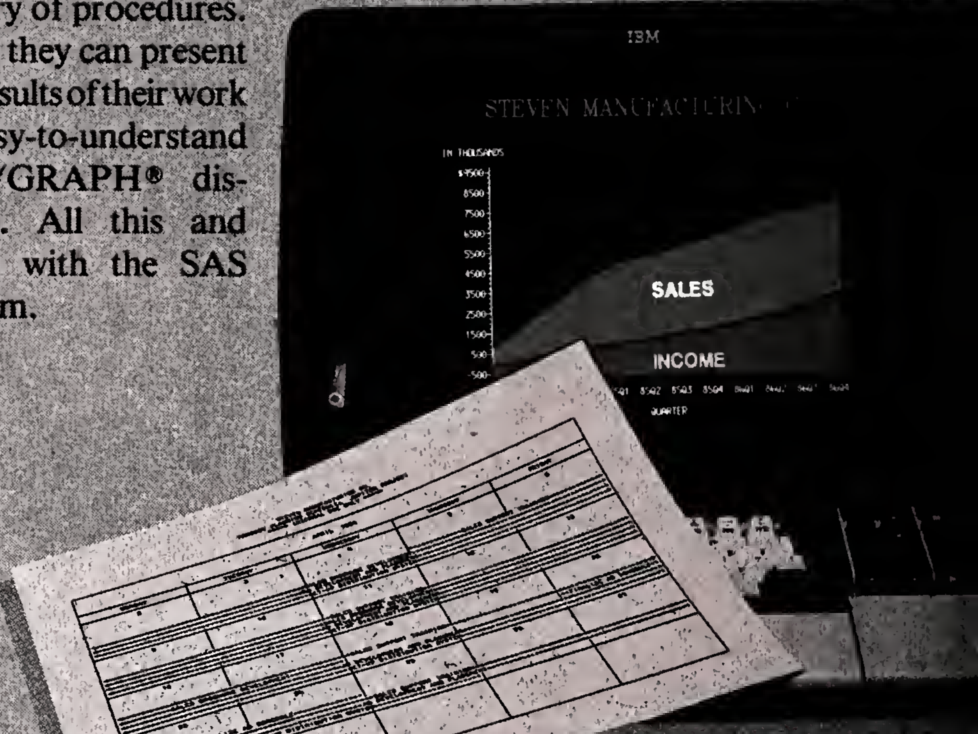


```
Command ===> _                  Edit SAS data set: EMP.INFO
-------------------------------------------------------------------
                         Employee Information

Employee Number:      109649
Employee Name:     Ms. Margaret Wells
Department:  Marketing          Location:  Bldg A      Work Phone:   4938
Birthdate:   04SEP57   Sex:  F  Marital Status:  S
Number of Dependents:   0       Social Security Number   242-23-3943

Home address:  Apartment D
               4905 Dana Drive
               San Jose              , CA  95126
Home phone:    555-7634

Information about Employee's Spouse:
Spouse's Name:      N/A
Spouse's Employer: N/A                          Work Phone:  N/A

In case of an emergency, please call:
 Mr. or Mrs. R. W. Wells        Relation: Parents
 205 Trail in the Pines
 Wilmington, NC  28402
 919/555-1234

Insurance Information:
           Carrier                   Dependents Covered
      Massachusetts Mutual                 No
      Blue Cross Blue Shield               No
```

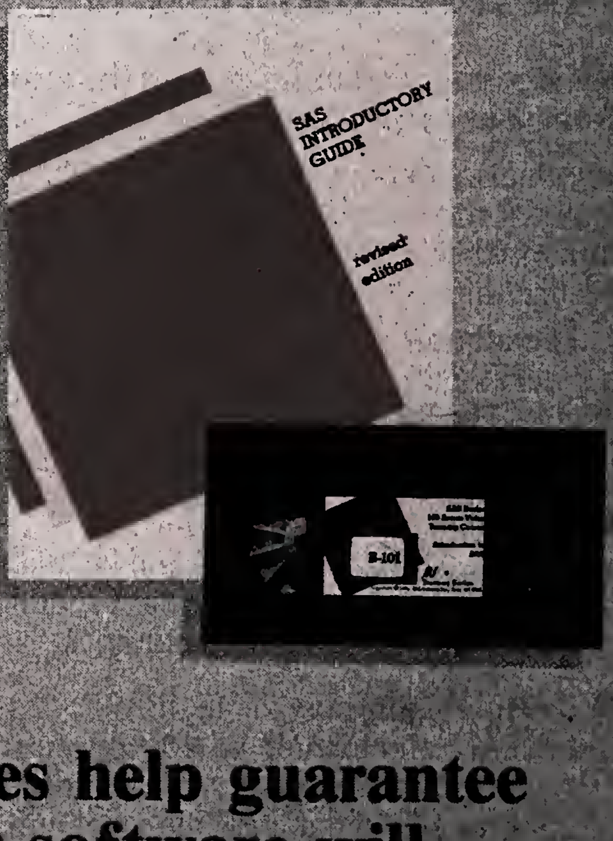
The accounting staff can quickly produce budgets and spreadsheet reports.



Your clerical staff can take orders, track inventories, and produce mass mailings. Managers can schedule projects and determine product mix with our SAS/OR™ product, and combine the results to make accurate forecasts with our SAS/ETS™ library of procedures. Then they can present the results of their work in easy-to-understand SAS/GRAPH® displays. All this and more with the SAS System.



With the SAS System, users only need to learn one language to accomplish all their tasks, and you only need to maintain one set of files for their needs. And one set of easy-to-read manuals and training aids. If they need more help, they can register for public training courses or you can schedule an in-house course for several users. We also develop videotapes to train your SAS users. And you can call us. Our full-time staff of specialists is ready to answer your questions.



> **“Our services help guarantee that our software will make you more productive.”**

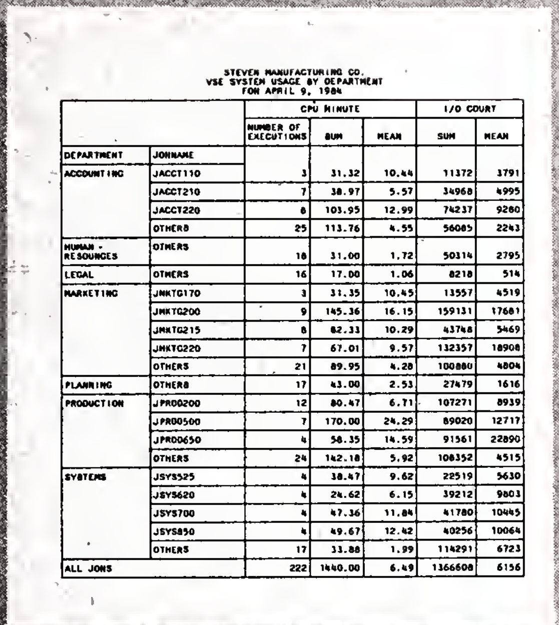
[illegible]

The Solution for Your Information Center

The SAS Solution for Programmers

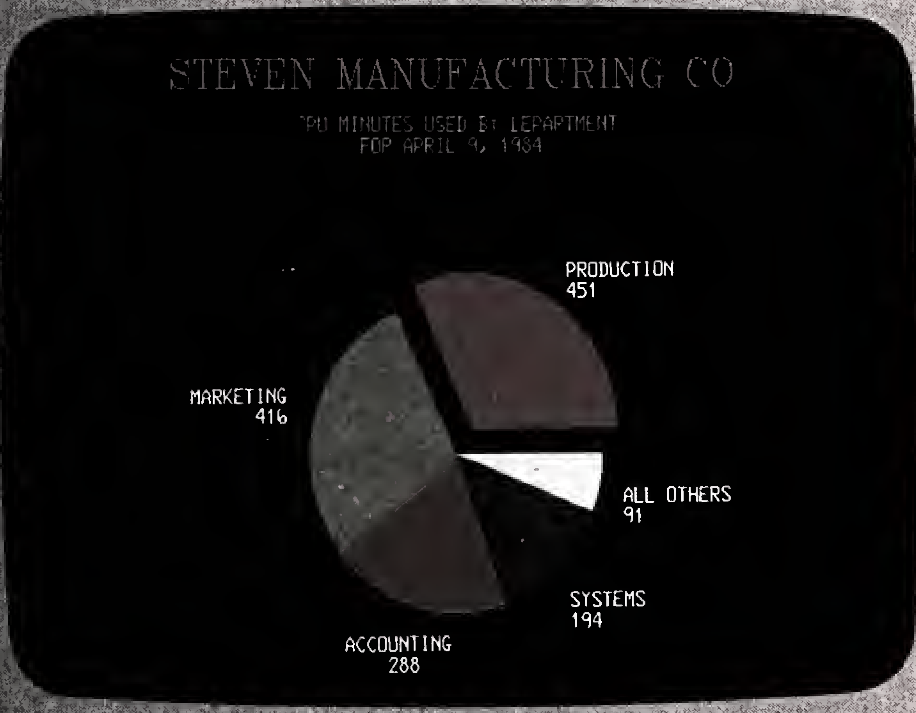
Once your Information Center is equipped with the SAS System, your DP staff is free to use SAS programming tools to develop complicated reports and analyses, measure hardware resources or system usage, and accomplish many other jobs. Data base administrators can use our SAS/IMS-DL/I® interface to build test data bases and DL/I programmers can implement their IMS-DL/I applications using the simple SAS language.

And with our new SAS/REPLAY-CICS™ tool, your DP staff can develop and store SAS/GRAPH displays in overnight batch jobs, then give them to managers for easy, orderly replay on their CICS terminals.



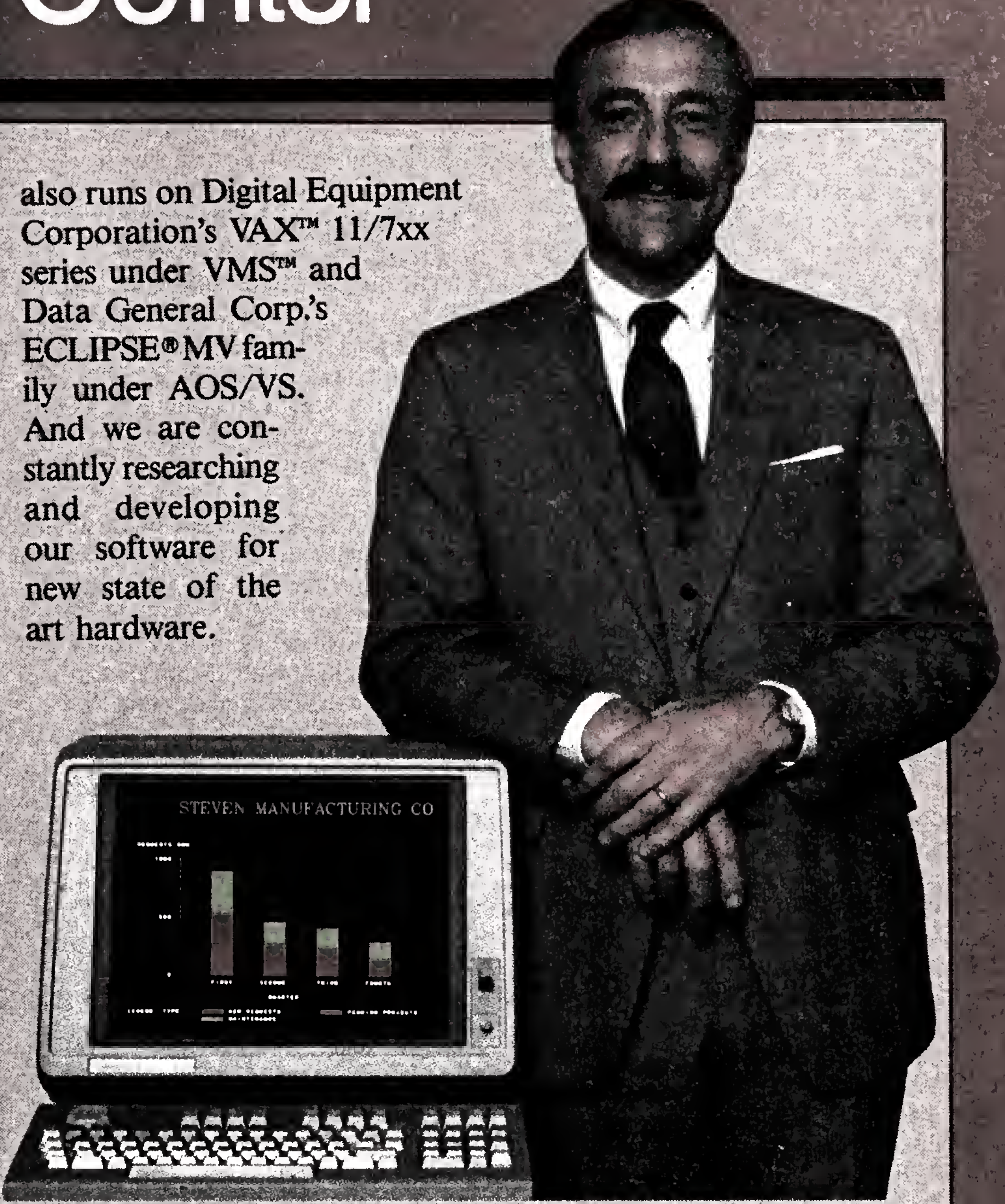
STEVEN MANUFACTURING CO.
VSE SYSTEM USAGE BY DEPARTMENT
FOR APRIL 9, 1984

		CPU MINUTE			I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
DEPARTMENT	JOBNAME					
ACCOUNTING	JACCT110	3	31.32	10.44	11372	3791
	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	8	103.95	12.99	74237	9280
	OTHERS	25	113.76	4.55	56085	2243
HUMAN - RESOURCES	OTHERS	18	31.00	1.72	50314	2795
LEGAL	OTHERS	16	17.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13557	4519
	JMKTG200	9	145.36	16.15	159131	17681
	JMKTG215	8	82.33	10.29	43748	5469
	JMKTG220	7	67.01	9.57	132357	18908
	OTHERS	21	89.95	4.28	100880	4804
PLANNING	OTHERS	17	43.00	2.53	27479	1616
PRODUCTION	JPROD200	12	80.47	6.71	107271	8939
	JPROD500	7	170.00	24.29	89020	12717
	JPROD650	4	58.35	14.59	91561	22890
	OTHERS	24	142.18	5.92	108352	4515
SYSTEMS	JSYS525	4	38.47	9.62	22519	5630
	JSYS620	4	24.62	6.15	39212	9803
	JSYS700	4	47.36	11.84	41780	10445
	JSYS850	4	49.67	12.42	40256	10064
	OTHERS	17	33.88	1.99	114291	6723
ALL JOBS		222	1440.00	6.49	1366608	6156



The SAS Solution for You

The SAS System runs on the corporate hardware you've already installed so there's no need to purchase additional equipment for all your new users. The SAS System runs on IBM 370/30xx/43xx and compatible machines under OS, VM/CMS, DOS/VSE, SSX, TSO, and ICCF. The SAS System also runs on Digital Equipment Corporation's VAX™ 11/7xx series under VMS™ and Data General Corp.'s ECLIPSE® MV family under AOS/VS. And we are constantly researching and developing our software for new state of the art hardware.



"In short, the SAS System gives you everything you need—at a price you can afford."

So put an end to the demands. Send the coupon or call us today for the solution to your Information Center needs.

SAS Institute Inc., SAS Circle, Box 8000, Cary, NC 27511-8000, USA. Telephone (919) 467-8000. Telex 802505.

Outside the US, call our subsidiaries in the United Kingdom, West Germany, France, New Zealand, Australia, and Singapore, or our distributors in Japan, Italy, Israel, South Africa, Brazil, Colombia, Singapore, and Saudi Arabia.

6/11

☐ I want to learn more. Send me **The SAS Solution** packet.
☐ Have a sales representative call me today!

Please complete this coupon or attach your business card.

Name ____________________
Title ____________________
Company ____________________
Address ____________________
City ____________ State ______ ZIP ______
Phone (______)____________
Hardware ____________
Operating System ____________

SAS Institute Inc.
SAS Circle, Box 8000, Cary, NC 27511-8000

SAS®

allows the programmer to specify that duplicate sort keys that appear on the input file will be in the same sequence on the output file.

Note also that the SORT input procedure may reference procedures outside of the SORT section. Likewise, procedures within the SORT section may be referenced by procedures in the main program.

Reference modification. Programmers may now reference a portion of a data item without needing to "subdefine" or REDEFINE that portion previously in the Data Division:

```
MOVE TELEPHONE (4:3) TO EXCHANGE
```

In this example, only the fourth, fifth and sixth positions of the data item TELEPHONE are moved (starting in position 4: for a length of 3).

(I suggest that programmers be careful when using this feature in that its misuse can lead to poorly documented program.)

INITIALIZE. A series of subordinate elementary data items may be initialized all at once using the INITIALIZE verb.

Consider the group data item in Figure 5 (on ID/22). If a programmer writes INITIALIZE SCREEN-PAGE, all numeric data items will be cleared to zero, and all nonnumeric data items will be cleared to spaces. There are facilities to restrict the initializing process to certain classes of data (numeric only, alphanumeric-edited only and so on) as well as to initialize fields to values other than zero and spaces.

INSPECT . . . CONVERTING. The CONVERTING clause of the INSPECT statement permits a shorthand way of writing multiple character replacement clauses.

```
01 BOTTLE PIC X(5) VALUE "WATER".
INSPECT BOTTLE CONVERTING "ATR" TO
"IN  "
```

This INSPECT statement results in three character replacements (A to I, T to N and R to space). It is a cheap way to PERFORM miracles in Cobol-80 by converting WATER to WINE.

REPLACE. To aid the programmer generally and specifically useful in dealing with possible conflicts over new reserved words in Cobol-80 and user-defined names in Cobol-74/68 programs, the REPLACE statement operates on source text and converts the source program before it is compiled (Figure 6).

```
REPLACE   ==END-READ==      BY      ==END-READ-PROCEDURE==
          ==CLASS==         BY      ==DATA-CLASS==
          ==ALPHABETIC==    BY      ==ALPHABETIC-UPPER==.
```

Figure 6

I expect that this feature will be most useful where Cobol installations create standard conversion library routines that can be copied into individual programs.

RECORD DELIMITER. A means of specifying variable length record conventions is provided in the FILE-CONTROL paragraph with the new RECORD DELIMITER clause.

DAY-OF-WEEK. The new reserved word DAY-OF-WEEK represents a one-digit character, which stands for: 1 = Monday, 2 = Tuesday, 3 = Wednesday and so on. It can be used as follows:

```
ACCEPT DAY-CODE FROM DAY-OF-WEEK
```

CLASS. A new CLASS clause in the SPECIAL-NAMES paragraph allows a programmer to name his own class of characters:

```
CLASS FIRST-HALF-ALPHA-UPPER Is "A"
THRU "M".
```

These new features along with some other more subtle additions and changes contribute to an up-to-date application language, complementing current trends in structured programming methodologies.

It is clear from these examples that Cobol is not dead. Indeed, it is very much alive and relevant to current programming practices. It is true that the Cobol language cannot stand still. Even with these improvements, the needs of the computer industry are growing too rapidly for the Cobol development process to slow down or proceed even at its normal pace.

Cobol must progress at a faster pace. New high-level features and other productivity aids must be introduced into the language for user consumption much more quickly than in the past.

If the potential delay until 1994 for features such as VALIDATE and intrinsic functions seems absurd to the reader, so it seems absurd to me. I have introduced proposals in both the American and international standards committees to change the procedures by which Cobol is developed [CW, Feb. 7]. These proposals have received some initial endorsement, but it is the computing public at large that has the real power to demand such a change.

Anyone wishing to express support or displeasure with the speedy development of Cobol can write to the chairperson of the X3J4 Cobol Committee, c/o X3 Secretariat, the Computer and Business Equipment Manufacturers Association, 311 First St. N.W., Washington, D.C. 20001.

It is important that those critics who feel that Cobol is slipping "behind the times" demand a more relevant Cobol language. If enough sentiment is expressed, perhaps we won't have to wait until 1994 for intrinsic functions and VALIDATE (and other very useful features) to be included in the language.

About the author

Jerome Garfunkel is president of Jerome Garfunkel Associates, Inc., training consultants based in Litchfield, Conn.

He currently presents a one-day Cobol seminar including a "Cobol-80 Guide" to groups in the U.S. and abroad.

Source code control is only one step in software configuration management.

Softool's Change and Configuration Control (CCC™) takes you all the way to *full* configuration control!

CCC automates: Management of changes and configurations, control over who makes what type of changes and where, tracking of trouble reports, reconstruction of previous versions, management reports, archiving, and all the remaining "steps" to total configuration control.

CCC is interactive and friendly. It supports all programming languages, and comes with on-line tutorials.

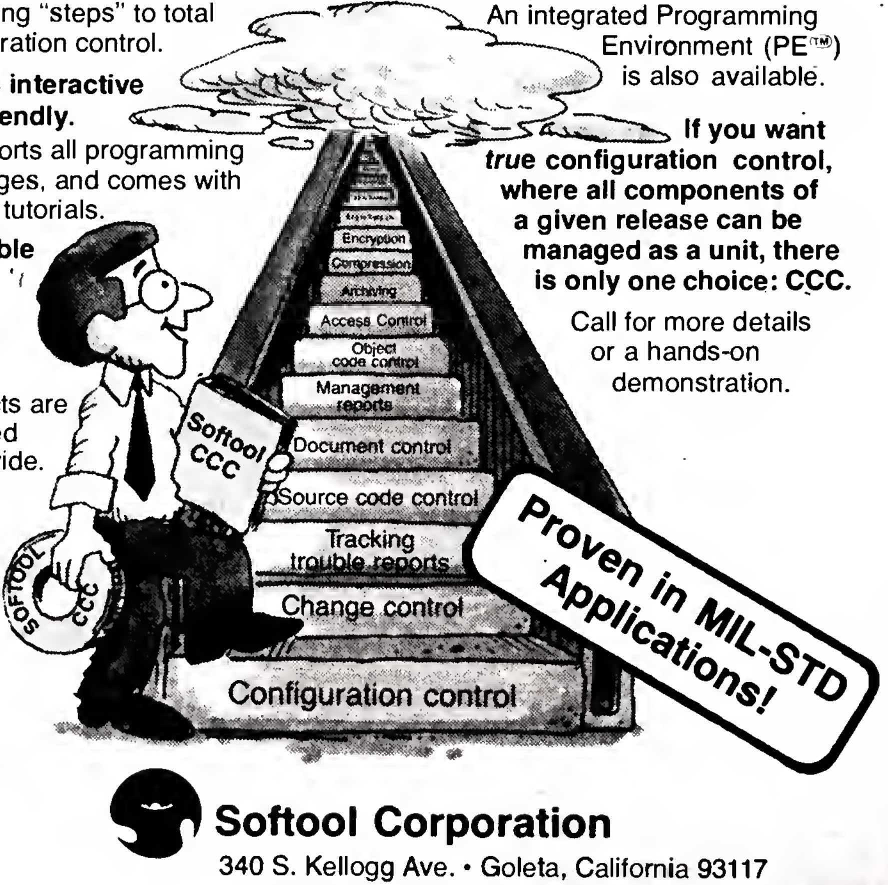
Available now! Over 1000 Softool products are installed worldwide.

CCC is supported on the DEC VAX, DG MV, Gould S.E.L., Honeywell 6000 (Level 66 and DPS 8), HP 9000, and IBM 370, 30XX and 43XX computers.

There is more. CCC is a stand-alone component of SOFTOOL®. An integrated Programming Environment (PE™) is also available.

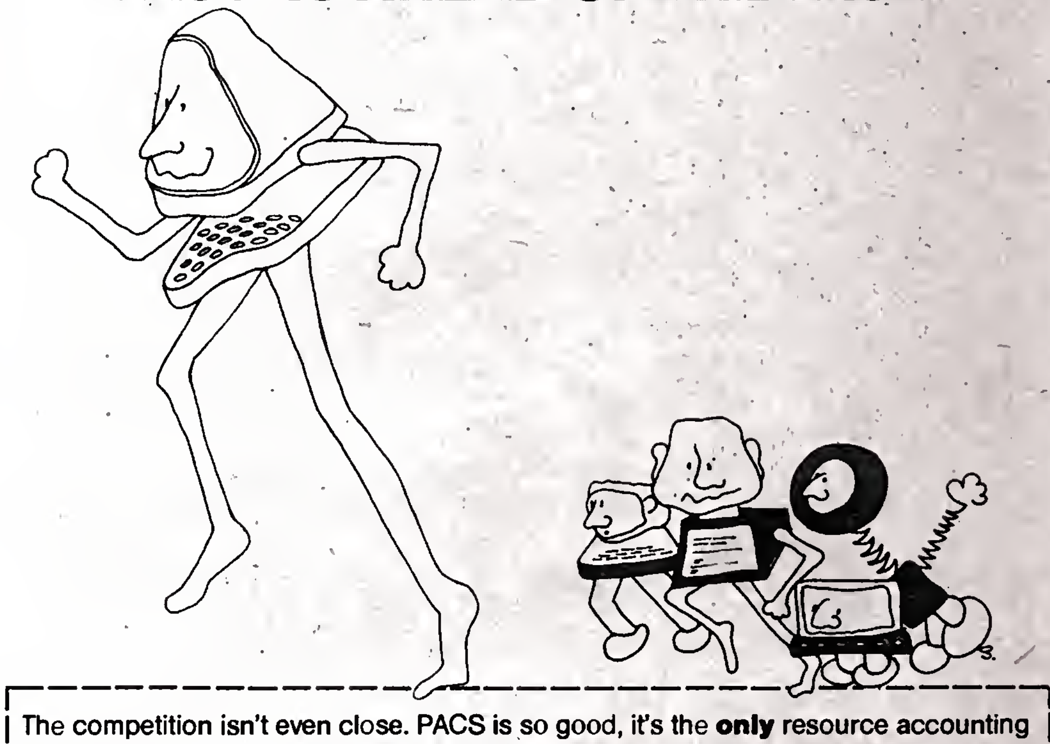
If you want *true* configuration control, where all components of a given release can be managed as a unit, there is only one choice: CCC.

Call for more details or a hands-on demonstration.



Softool Corporation
340 S. Kellogg Ave. • Goleta, California 93117
(805) 964-0560 • Telex 658334

FOR VAX™ RESOURCE ACCOUNTING, PACS™ IS AHEAD OF THE PACK



The competition isn't even close. PACS is so good, it's the **only** resource accounting package in DEC's™ EAS library. Here's why:

- Flexible billing algorithms
- User budgeting and port speed accounting
- EZLOG™ for true 3-level reporting by account, project and user

Name ____________________
Title ____________________
Company ____________________
Address ____________________
City ____________ State ____________ Zip ____________
Phone (   ) ____________________

SEND COUPON NOW FOR COMPLETE DETAILS ON **ALL** THE PACS BENEFITS

STI Signal Technology, Inc.
5951 Encina Road, Goleta, CA 93117 (805) 683-3771 **Outside California call toll-free (800) 235-5787**
TWX 910-334-3471

VAX and DEC are trademarks of Digital Equipment Corporation
COWK

Maintenance isn't maintenance anymore

By Robert O. Peterson

The most common cry from programmers and analysts leaving an organization for greener pastures has always been: "I just got sick of doing nothing but maintenance — I want to get involved in some real development."

So, being imaginative people, let's do something truly inspired and rename the group "production support."

Of course, we should do more than change the name. We can start by recognizing a few facts about the service an MIS group provides and defining the personalities appropriate to support work. The next task is to describe the responsibilities and authority the production support group should have.

The enhancement cycle for operational products has become significantly accelerated, making the life cycle for any single program and system longer. Often that life span lengthens at the expense of the delivery capability itself, closing a vicious circle.

At the same time, opportunities for new systems are being uncovered constantly. The speed with which new systems are required to achieve corporate goals is accelerating. Because the value of these systems is so high, data processing

Give maintenance another name — production support. This group within MIS should be able to attract experienced, ambitious professionals and offer career potential comparable to the development area.

> *This is not to say that the best development analyst should be working on it. If he is good at development, he probably will not be good at support for the long haul. The better a person is at development, the worse he'll be at support.*

departments have tended to concentrate on new development rather than in-place products.

Concentrating on new systems is bound to make operational systems support suffer. The old systems will continue to deteriorate until the foundation collapses.

The reverse is equally dangerous. New systems must be installed, and the people who do well must be kept challenged and busy. The aggressive development person considers time spent on operational products uninteresting. It is essential to separate development support from production support (if not organizationally, then functionally).

Historically, new programmers were assigned to maintenance until they earned their spurs and were deemed suitable for development. Maintenance was considered the best training ground for the applications these programmers were to service.

Strongest person needed

No one with any experience wanted to work in maintenance for very long. Yet support is far too important to entrust to a novice. When the ability of MIS to support a product is jeopardized, the strongest person should be assigned to correct the problem.

This is not to say that the best development analyst should be working on it. If that person is good at development, he probably will not be good at support for the long haul. The better a person is at development, the worse he'll be at support. It is a simple matter of direction and the way people gain their gratification.

Consider what we're teaching a novice programmer when we assign him to application maintenance. He will invariably learn a great deal from the old systems and programs that come his way.

When You Need Computer Equipment Moved!

Rely On Experts

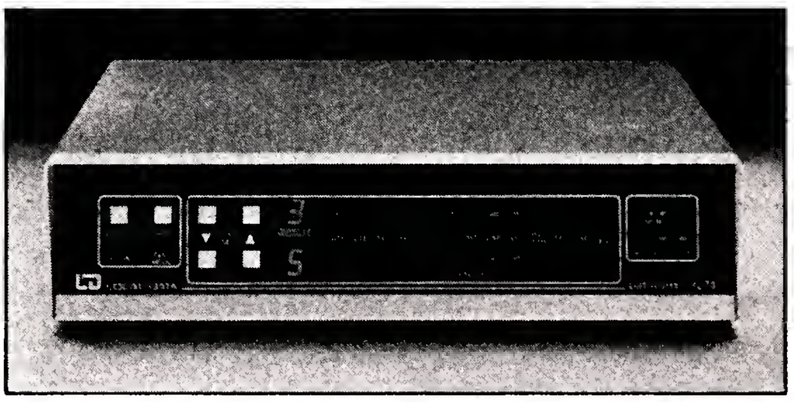
- One-Day Pick-up and Delivery
- Competitive Rates
- Specially Equipped Radio Dispatched Trucks
- Air Freight Handling
- Warehouse Facilities
- Full Insurance Coverage

Serving Southern California Since 1970

For more details, call toll-free:
(800) 821-5270
U.S. except Calif.
(800) 521-5537
California

Southern California Delivery Service
Computer Transportation, Inc.
2914 E. 46th Street, Los Angeles, CA 90058

No other 3270 protocol converter can match all these features.



Since 1977, hundreds of companies all over the world including Bell Labs, Citicorp, ITT, Litton, Westinghouse—have used Local Data products to make IBM communications easy and inexpensive.

We believe the DataLynx™/3274 is the best price/performance 3270 protocol converter on the market.

So, before you buy any other protocol converter at any price, compare the DataLynx/3274 features first. Then decide.

- SNA/SDLC or BSC protocols supported. SNA is PU type 2.
- BSC for EBCDIC and ASCII.
- 16 bit, 8 MHZ Intel 8086-2 CPU.
- Auxiliary printer support allows each async port to have a separately addressable 3287 type printer. This feature enables dial users to combine CRT and print data over one dial-up line.
- 80 types of ASCII async display terminals can emulate IBM 3278 display stations, and ASCII async printers to emulate IBM 328X printers.
- Micro to main-frame support with our FileLynx™/3278 program for the IBM PC and PC compatibles supports terminal emulation and file transfer (upload/download).
- Hard copy KSR support with our "Paper/3278."
- Unique "paging" feature supports emulation of *all* models of the 3278 display station.
- Pseudo-transparency feature allows host application to transmit character and control codes to async terminal devices (e.g. graphics terminals, graph plotters, mini-computers, high-speed printers with down-loadable forms control units).
- "Compu" support for micro, mini and instrumentation computers as terminal devices.
- Dual host support.
- PROM cartridge for easy user upgrade of firmware.
- Powerful, friendly configurator mode, using menus to allow parameter definition for sync ports, logical units, async ports and terminal characteristics, including help utility.
- Configuration values saved in non-volatile EEPROM.
- Monitor mode displays current status of all ports and logical units.
- May be connected to a host directly (in modem eliminator mode), or via modems on a dedicated multipoint or point-to-point line (dial-up or dedicated), via RS-232C sync ports.
- Data rates to 19,200 bps (sync & async).
- Async ports may be configured for any of 15 fixed bit rates or "autobaud", with or without parity checking, and with a specified character format.
- Simple DTE/DCE change on all ports.
- Flow control on async ports may be configured for physical and/or logical signalling.
- Virtual device support enables reconnect of dial users independent of physical port.
- Security through dual level password protection.
- Emulation of standard 3278 keyboard functions is tailored for each supported terminal type.
- 25th status line emulation.
- SAS®graphics support.
- Base color support.
- 3278-5 (27 x 132 character screen) support on 9 channels with memory expansion option.
- LU configurator options provide support for various screen formats and printer page widths.
- Front panel includes 33 function status indicators.
- Self-test of channels, memory and firmware integrity is performed continually in background mode assisted by a "watchdog" timer.
- UL and FCC approved.

For more information about the remarkable DataLynx/3274 protocol converter, call or write today. And ask about our 30-day free trial program.

LOCAL DATA
DATALYNX™/3274

SAS® is the registered trademark of SAS Institute, Inc.

LOCAL DATA
"Your Lynx to IBM."

LOCAL DATA · 2701 Toledo Street · Suite 706 · Torrance · CA · 90503 Telephone (213) 320-7126 TLX 182518
In Canada call (613) 737-5941

NAMEWARE

AMBI
Stamford, CT
Voice/data telephones
(Formerly Digital Transactions)

COGNOS
Ottawa, ONT
Business/financial software
(Formerly Quasar Systems)

COMPAQ
Houston, TX
Portable computers
(Formerly Gateway Technology)

COMPATH
Oakland, CA
Business telephone systems
(Formerly Scott-Buttner)

DATAGO
New York, NY
Computer stores
(New venture of NYNEX)

DAYFLO
Costa Mesa, CA
Software for IBM PC
(Formerly Gilchrist Software)

ECZEL
San Francisco, CA
Computer supplies
(New venture of CrownZellerbach)

MINDSET
Sunnyvale, CA
Home computers
(Formerly RHB Computers)

SOFTRA
San Diego, CA
Software transaction systems
(Formerly Publishing Technology)

BY NAMELAB®

Contact us for free booklets on product and company name development

NAMELAB INC.
Name Development & Testing Laboratory
711 Marina Boulevard
San Francisco, CA 94123 • 415-563-1639

The CPT Solution that talks with mainframes in an important new way:

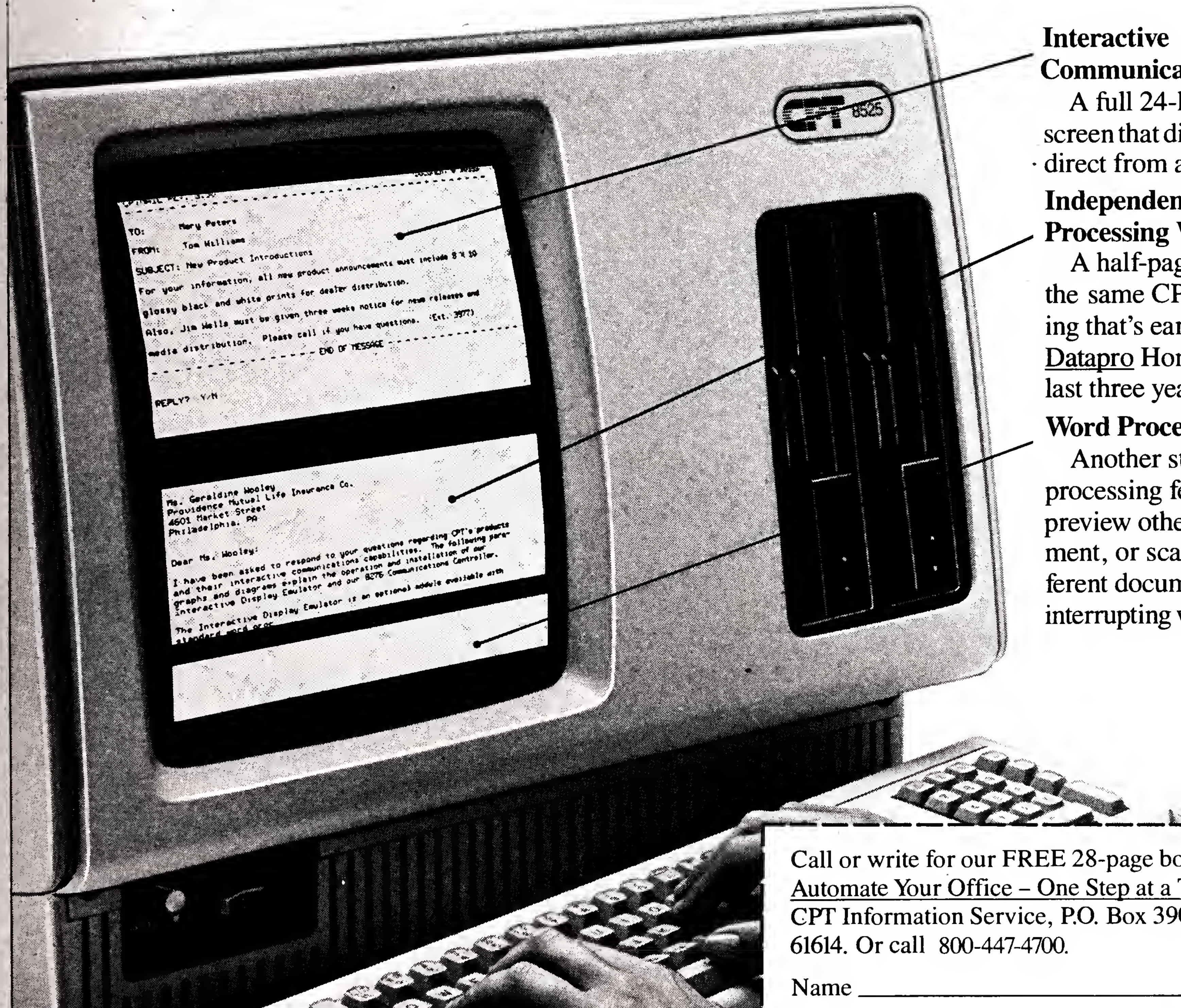
CPT solves the costly, cumbersome problem of separate data terminals and word processors at individual workstations.

An exclusive software breakthrough enables one CPT system to perform both functions. On the same screen. At the same time. We call it the CPT Interactive Display Emulator (IDE).

With this new CPT solution, an operator can transfer data processing information from a host computer (top window) directly to a word processing document-in-progress (middle window). Or vice versa. With just two keystrokes.

In addition, an optional CPT SNA communications controller can link up to 7 CPT systems together as part of an IBM 3270 network.

A few toll-free keystrokes on your telephone will bring you more information. And open some important new windows on the future.



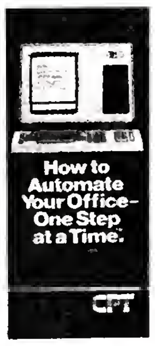
```
TO:       Mary Peters
FROM:     Tom Williams
SUBJECT: New Product Introductions
For your information, all new product announcements must include 8 X 10
glossy black and white prints for dealer distribution.
Also, Jim Wells must be given three weeks notice for new releases and
media distribution.  Please call if you have questions.  (Ext. 3977)
------------------ END OF MESSAGE ------------------

REPLY?  Y/N

Ms. Geraldine Wooley
Providence Mutual Life Insurance Co.
4601 Market Street
Philadelphia, PA

Dear Ms. Wooley:

I have been asked to respond to your questions regarding CPT's products
and their interactive communications capabilities.  The following para-
graphs and diagrams explain the operation and installation of our
Interactive Display Emulator and our 8276 Communications Controller.

The Interactive Display Emulator is an optional module available with
standard word proc
```

Interactive Communications Window
A full 24-line by 80-column screen that displays information direct from a host computer.

Independent CPT Word Processing Window
A half-page display of the same CPT word processing that's earned a place on the Datapro Honor Roll for the last three years.

Word Processing Preview
Another standard CPT word processing feature. It lets you preview other pages in a document, or scan an entirely different document, without interrupting work in progress.

Call or write for our FREE 28-page booklet, How to Automate Your Office – One Step at a Time.™ Mail to CPT Information Service, P.O. Box 3900, Peoria, Illinois 61614. Or call 800-447-4700.



Name ____________________

Title ____________________

Company ____________________

Address ____________________

____

Phone ____________________

CPT®

Office automation you can't outgrow

Specifications are subject to change at the discretion of CPT Corporation.

CW-44

The more a system approaches obsolescence, the more time will be spent on support and maintenance for it. The techniques to be found there will, in all likelihood, be those that your staff has progressed beyond and that you no longer want to replicate. That is the nature of the business: What is elegant today is archaic tomorrow.

Well, these novices are going to pick up those traits and techniques, and you're going to spend a substantial amount of time training the technique out of them. It takes considerable experience to understand the difference between good and bad design and code.

Personality traits

Typically, a successful development person will possess some very distinct personality traits. First, he will be almost totally project-oriented. This means he will be able to concentrate completely on the specific project he finds himself involved in at the time. The more separate projects are assigned, the more difficult it will be for him to maintain that concentration.

The successful completion of the project is the main goal, and recognition is generally gained for the project's completion rather than the long-term impact of the product itself. Little interest or excitement can be generated for what is perceived as the mundane aspects of the effort — documentation, operator instructions, library maintenance and so forth.

It should be apparent why these activities are considered mundane and unpopular. They simply represent the ongoing aspects of a system and not the discrete begin/end orientation of a project. A development person likes to finish a project, gather his praise and move on to something new. There simply is no joy or glory in remaining with the product after it is implemented. Also, it is no longer "new."

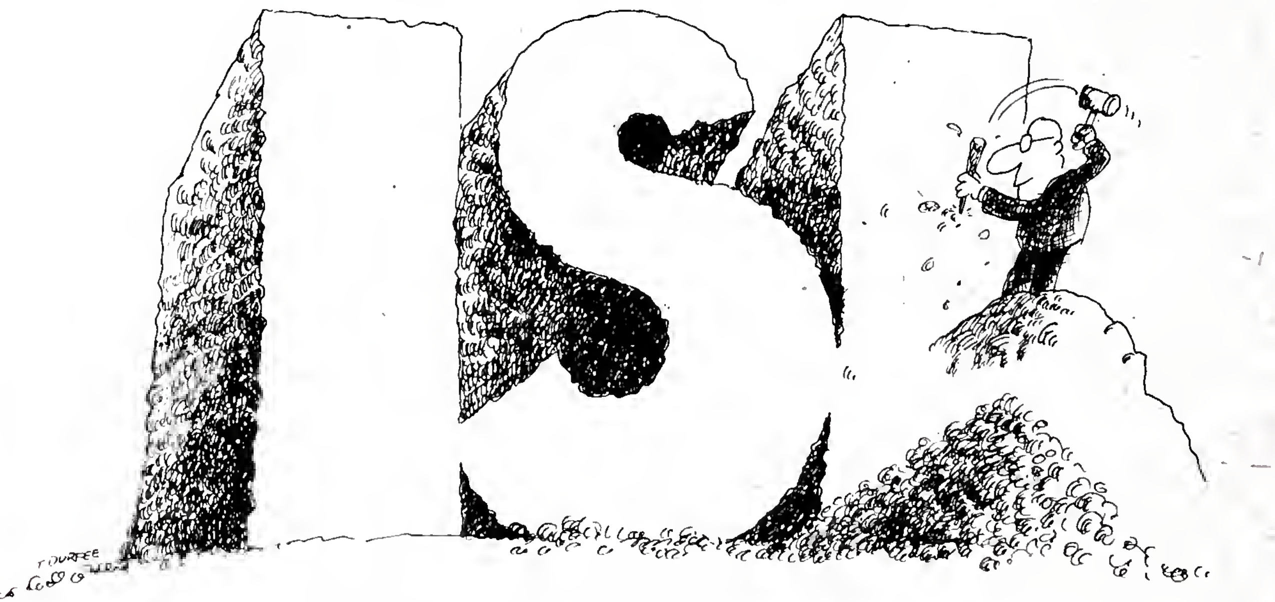
That's the second important personality characteristic that concerns us here: an almost pathological need to be involved in something new. This takes the form of new tools, new applications, new machines, new operating systems or any or all of the above.

When stated positively, it goes like this: "I want to move forward, on the leading edge of technology." If you choose to state it negatively, it sounds like, "The jerks just don't want to put up with the garbage they implement."

However you choose to state it, keep in mind that the two characteristics (and a number of others) are essential to a successful development person. If his personality doesn't effectively match, he'll be unhappy and therefore unproductive. It goes with the turf. Realistically, these are not the people you want maintaining

> *The second personality characteristic is an almost pathological need to be involved in something new.*

THE HARD FACTS ABOUT PAYROLL/PERSONNEL SOFTWARE.



In head-to-head competition, software buyers select the ISI Payroll/Personnel System 90% of the time.

Once you have the facts, decision-making is easy. And it's a fact that when ISI competes against other systems, ISI consistently wins out. It just takes a demonstration of ISI software. We're the industry's Payroll/Personnel specialists. And clients recognize the best.

Clients like Ford Motor Company, Harvard University, Phillips Petroleum, Bank of Montreal, First Interstate Bancorp, Hartford Insurance Group, and the State of Colorado, to name a few.

We're miles ahead of the competition in system architecture and system documentation. We offer more real-time, on-line expertise than any other vendor. And we're committed to customer service. We're always ready to be on-site to help with any aspect of your installation. And that includes fixed-price customization.

ISI software is versatile, too. It's designed to run on all IBM mainframes, the IBM System/38 and Prime. ISI supports data base and data communications environments including IMS, ADABAS, DATACOM, IDMS, VSAM and CICS, IMS DC, ADS/on-Line, NATURAL and IDEAL.

Call us. We'll answer your questions with the kind of straight talk and hard information it takes to make informed decisions. We think you'll see why Datamation Magazine ranks ISI number one in payroll/personnel software.

Setting the standards for excellence.

INTEGRAL SYSTEMS INC.
165 Lennon Lane, Walnut Creek, California 94598
In the U.S. call toll-free 800-824-8199, in California 800-824-8198,
locally and in Canada (415) 939-3900.

Sales and support offices located throughout North America.

Family Bond.

Your family's savings program is unique. You have different needs. And different concerns. That's why so many families have made U.S. Savings Bonds their family bond. It's the bond that holds a family's savings program together.

That's because bonds offer so many guarantees. Guarantees that are just right for any family. Like guaranteed interest return. Guaranteed tax benefits. Guaranteed safety. And all backed by the most solid guarantee of all. America.

So, when you're looking for that bond as unique as your savings needs, look to U.S. Savings Bonds. They really are the Family Bond.

Take stock in America.

UNITED STATES SAVINGS BONDS

A public service of this publication and The Advertising Council

and supporting the systems by which you live and breathe. The people you want performing that function have two characteristics that are diametrically opposed to normal development and are essential for success in production support.

The successful support person takes pride in maintaining an effective and consistent "steady-state" in the systems being run. He is insulted any time a system fails to run, is inefficient, does not adequately support the users' needs or is poorly structured.

He typically seeks shorter term gratification as far as assignments go, and he enjoys and functions best under pressure. He also appreciates and seeks opportunities to improve the administrative aspects that surround and support a system, such as documentation, operator instructions and so forth.

Pragmatic view

While the support person takes pride in being on the leading edge of technology, he takes a far more pragmatic view of it. For him, it is not just important to do something new, but to understand its applicability to the environment and its impact on what is already being done effectively. They tend to be people who adjust things that already work, milking the most out of current facilities and adapting new techniques rather than carte-blanche adopting them.

Where do we find these people? They probably come from three major sources:

Operations. If there is any group whose primary concern is getting the work out, it is operations. To bring an individual in from operations takes training. Also, don't assume that just because he is there that he wants to be. It may be that he is merely a wild-eyed development person who figured that he had to start as an operator.

Users. Most users function in a "maintain and enhance" type of atmosphere. They understand the implications of nondelivery of baseline services and are sensitive to them. Their understanding of the business is generally more mature than MIS people, which usually implies a fairly decent perspective on competing priorities. Once again, training is required, and to a substantially greater extent than operations. However, that investment in training buys you an extraordinary level of real-world expertise and interdepartmental loyalty.

Development. We described earlier two characteristics of a development person that made him a questionable choice for support. However, do not assume that just because a person is in development he possesses those characteristics.

For years we have downplayed the importance of support and emphasized development. Anyone who had any ambition at all, regardless of orientation, found it necessary to move to or through that area. The people who would function well in a support role are, in fact, alive and well in development — you just have to sort them out.

You have to do at least one other thing beyond finding the people. You have to make it advantageous for them to commit themselves to a support group.

A development person likes to finish a project, gather his praise and move on to something new. There simply is no joy or glory in remaining with the product after it is implemented.

We talked earlier about changing the name from maintenance to production support. We also talked about how unlikely it was that it would make any difference in and of itself. If that's all we plan to do, it makes no sense, either from a functional or practical point of view.

The objective is to make the group a viable and effective force in the future of MIS. We do that by providing the group with the responsibility to keep with departmental goals and the authority to meet those goals.

Those responsibilities are going to vary among organizations. They will also vary based upon the skill level and administrative capabilities of the manager of the group. However, the responsibilities described below are reasonably basic and applicable to most departments.

To define the responsibilities of any group, you must begin with the broad charter under which they operate. From there, detailed definitions become a matter of internally describing those activities required to fulfill the charter. In this case, although details may vary by organization, the basic charter is to:

- Perform those duties necessary to ensure that operational systems are maintained in a status that ensures their continued execution in a state consistent with specification.
- Ensure that new systems are implemented in a way that contributes to overall system stability.

As a statement by itself, this has little meaning, either philosophically or practically. However, statements such as this should be part of the hierarchy of any organizational structure. The real "meat" comes in the detailed description of how the charter is met. Equally important is a statement as to the specific authority the group has in relation to other groups within MIS. These charges and authorities are stated in a variety of ways in different organizations.

3270 Access

■ Expanding 3270 access to any terminal you have ■

TYMNET simplifies 3270 access.

All it takes is a terminal and a local call to the TYMNET public data network.

We let you use the async terminals and personal computers you already have.

We give 3270 terminals the versatility they need to access async services and independently access 3270 applications on one or more hosts.

There's no hardware or host software to buy. And TYMNET delivers price performance other data networks can't.

What could be simpler?

For more information,
call or write for
TYMNET's
"3270 Access"
brochure.

TYMNET, Inc.
2710 Orchard Parkway
San Jose, CA 95134
(408) 946-4900

Public and Private Data Networks

TYMNET®
A Tymshare Company

> *At that point, production support calls the shots. It has the authority to call in whatever people are needed. At times, the group will overstep its bounds and roust people out of bed who really don't need to be called in. Directors of MIS, especially, feel they've already paid their dues.*

Once a system is placed into production, all problems beyond the simple operator/hardware issues would come to the support group. The group would resolve the issues in whatever fashion was required.

If it meant user contact, the group would initiate that contact. If it meant program/system/job correction, support would make those corrections. If it meant reruns, it would control and monitor those efforts. In short, the group is charged with all those activities typically associated with a senior analyst in development who was responsible for support of the application in question.

What we have implied is that a considerable level of expertise and seniority exists within the group. There should be the same degree of capability here that exists in development, with the same career pathing and compensation. When problems of a significant nature occur, the group should have the authority to call upon whatever expertise is needed to accomplish speedy and effective correction. This becomes a significant issue when a problem arises at 3 a.m. (All systems crash at 3 a.m. — it's inevitable.)

At that point, production support calls the shots. It has the authority to call in whatever people are needed. At times, the group will overstep its bounds and roust people out of bed who really don't need to be called in. (This especially applies to directors of MIS, who feel they've already paid their dues.)

This type of situation creates ill feelings and runs counter to the charge of the group. A problem like this is a management issue. It should be resolved by the management of the offended and offending groups, not by two or three programmers in the middle of the night. Regardless of how apparently absurd the request is at 3 a.m., accede to the request and complain the next day — away from the fire of the situation and with the management people who determine the validity of the request.

Project turnover

The responsibility to support and control the resolution of problems cannot be realistically accomplished unless the group has some control over the quality and consistency of the product it supports. The means to accomplish this are twofold: development and implementation of standards and procedures to support the goal and the mechanisms to ensure adherence to those standards. This last item is accomplished, officially, at product turnover.

Inevitably, the development projects reach that glorious stage when they will be implemented. At that point a series of activities takes place to "move" the components from a construction or test phase into the supportable environment in which they will run.

Turnover is an appropriate word since it means a transfer of responsibility for the product itself. That transfer can either be handled inelegantly by "pitching it over the wall" into operation's lap, or it can represent a discrete step in which the product is verified and entered into a true production steady-state.

Give it control

If you take the approach of over-the-wall implementation and entrust the qualifications of the product to your development people, don't bother establishing a support group. It won't work well, and it will be counter

Only from Topaz...

Uninterruptible Computer-Grade Power Systems

including Powermaker® Micro UPS

They're in a class by themselves.

Topaz Uninterruptible Power Systems are valued throughout the world for their high reliability, high efficiency and quality construction.

All Topaz Uninterruptible Power Systems deliver pure, continuous computer-grade power, regardless of the condition of the AC power line. Your computer stays on-line during blackouts, brownouts, sags, surges, and power-line noise disturbances. In other words, a Topaz UPS makes power-related computer problems disappear. Period.

Available in micro, mini, and super-mini models, there's a Topaz UPS specifically designed for your equipment.

Find out more about our computer-grade Uninterruptible Power Systems. Call us today at (619) 279-0831, or contact your local Square D distributor.

TOPAZ
Excellence in Computer Power

SQUARE D COMPANY

productive. The only way to make a support group work is to give it the ability to control its environment.

At turnover time, the support group reviews several items specific to its needs. A sample list and the rationale might include:

Source code. A critical review of the source to be made operational would ensure adherence to standards and provide ease of maintenance, proper usage of catalogued libraries, appropriate resource utilization and any other aspect of the program itself that is considered essential to proper support. This would not represent a critique of the authors' style or the conformity of the program/system to the original user requirements. That is a function of the development group.

Job control. Job control language is reviewed in the same manner as code except that computer operations must take part in the process. The support group's concern here revolves around recovery and simplicity for its own purposes. In-stream documentation is a major consideration since support must deal with it in the middle of the night over the phone.

Libraries. Operational source, job control language and any libraries that support and complete production jobs are the property of operations. The movement and maintenance of those libraries should be in the hands of support for administration and certification. Library usage is certified as to applicability, efficiency and maintainability. The physical movement should be controlled by the support group in a "change management" role, probably in multiple levels.

Documentation. Whatever documentation you require to accompany the system should be reviewed as critically as any other component. It must follow standards and be meaningful, well-written and useful. As much as possible, have your documentation appear as a by-product of the system itself. Have console messages and actions embedded in the program rather than in a raft of separate pages that will either get lost or never be referenced. Job documentation should appear in the job streams themselves. As much as possible, all documentation should be provided and maintained on-line.

The turnover process can become extremely unwieldy and bureaucratic if it gets out of hand. Somehow, that must be avoided. In many organizations it is simply a necessity for the developer to pass the new system through multiple areas. If you can combine some of these into one area as a certifier, you will have eased the burden somewhat. It is important to remember that any process or procedure is meant to net a positive result and not become an end in itself.

What happens if the system fails turnover? After spending six months and 18 man-years in development, do you say to the users, "Sorry, guys, but you'll have to wait?" Not if you want to keep your job very long. Do you force the support group to accept the product? Not if you want to maintain any internal integrity at all.

If small changes are required that externally cause little disruption in the overall schedule, the development group should make the changes as soon as possible after the system goes in. It becomes a condition for acceptance. If the time frame is significant, however, the product should still be put into production. The user community should not be made to pay a price for our internal incompetence.

> *This situation creates ill feelings. It is a management issue and should be resolved by the management of the offended and offending groups, not by a couple of programmers in the middle of the night.*

If you legislate a system into production — and I guarantee that at some point you'll have to — do not legislate the support group into taking responsibility for it. It is the development group that has failed to meet the commitment. It will continue to fail the commitment if allowed. Remember, development's main consideration is project-oriented and governed primarily by time. If the system is operational, the users have already awarded development its hero badges. However, there is a simple and logical avenue to follow. If development puts a system into production that support will not accept, then development must support it.

That seems, on the surface, contrary to one of the primary reasons for establishing the support group in the first place. If you leave it at that, you will in fact defeat the organization and negate nearly all the good that can be anticipated.

Judging performance

The way around the situation lies in the method by which you judge your development group's performance. If you judge it based upon the percentage of time dedicated to development itself and consider any other time as a negative, then don't accept any time spent in support as productive. If a system is projected to be late because the lead analyst spends 20 hours a week supporting a production system that failed turnover, refuse to accept that as a valid reason.

Any time spent in support in this particular case should not be recognized at the management level. If management wants to support those

Accessibility
for custom network systems

Making data communications accessible to more people

TYMNET has conquered America's last frontier.

The challenge—Alaska's rugged terrain. And its widely scattered population.

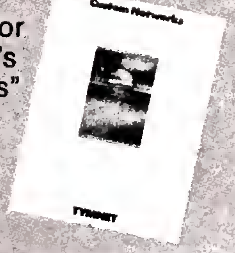
TYMNET integrated Alascom's leased line, microwave, and satellite facilities into a sophisticated custom data network—AlaskaNet.

Now, Alaskans even in the most isolated locations use AlaskaNet to access computer systems and services such as electronic mail, Telex, travel reservations, and electronic banking with virtually any terminal.

AlaskaNet supports 15 different protocols and provides connections to the world's major public data networks.

Discover what TYMNET accessibility can do for you.

Call or write for TYMNET's "Custom Networks" brochure today.



TYMNET, Inc.
2710 Orchard Parkway
San Jose, CA 95134
(408) 946-4900

Custom and Public Data Networks

TYMNET®
A McDonnell Douglas Company

systems rather than get them into proper shape in the first place, so be it. But management should do it on its own time, not yours. The problem will very quickly become self-correcting, and development will recognize the distinct advantage in a successful turnover.

It would be enormously helpful to avoid this type of problem. The only effective way to do so is to make sure that the system will pass turnover while it is being developed rather than at the end of the process. No one likes surprises. One way to lower that risk is to make turnover preparation an integral part of the development process itself.

Involvement of support

When the initial design of the system takes place, get your support people involved. They should have input to the design and construction of the system since they are theoretically the production-environment experts on your staff. Early exposure allows them to prepare for the upcoming implementation, provide input as to the impact on current systems, specify how much post-implementation support is required from the development team (this should be included as part of the estimate and schedule) and determine the level of involvement in forthcoming phases.

This involvement can take many forms and will vary from system to system. It will be dependent to a large extent on the development methodology you have in place. It can include review of new standard routines while they are being developed and attendance at walk-throughs for large, complex systems. It can also be as simple as being on the distribution list for status reports.

In any case, give them their shot early and make them stick to it. Don't accept, as an excuse, that they don't understand the system at turnover when they didn't want to get involved six months ago. (Any development manager with any brains will require his programmers to invite a support person to every walk-through and sign off on the project. It will be very difficult for support to reject a program when it sat in on a walk-through on it earlier.)

Common approach

Standards are developed for one reason — to ensure a common approach to whatever you are applying standards to. It is implicit that the common approach nets a gain for the organization and the process to which it is applied.

Programming standards generally fall into two categories: those that apply to system efficiencies as far as hardware/systems software and those that are enacted to ensure simple maintenance. For our discussion, we'll concentrate on the second category — those that are maintenance-simplicity driven.

You will notice that development was not mentioned as a reason to impose standards. That was purposeful. Development, as a function, does not in any way benefit from the existence of departmental standards in the area of design or programming. The standard practices they require are project-oriented and tend to describe how modules of a system will interact.

Their usefulness ends at the culmination of the project. If they need not support the final product, it makes little difference to them how that product fits into the rest of the world.

Every project leader would agree that the above is a generalization. Since team members usually are assigned across different projects, it is nice to at least have a new member program and design in the same manner as veteran members.

The race is on for more efficient and reliable data communications. And once again NEC puts you out front with three new low-cost, high-performance entries.

NEC's 2,400bps full duplex modem is designed for operation on 2-wire switched network lines. The innovative DSP2420 features an automatic adaptive equalizer for maximum performance. It automatically adapts speed and modulation to the remote modem. And it comes with a full complement of test features built in.

NEC's 4,800bps modem is compatible with Bell's 208A/B. Advanced microprocessor technology provides the N4810 with superior data communications in point-to-point systems over the dial-up network or two and four-wire private line circuits.

NEC's 14,400bps modem is a significant advance in high-speed modem technology. The DSP1440M utilizes unconditioned circuits and can be used [illegible]

NEC Corporation
Tokyo, Japan

IBM/38 MAPICs UNMUZZLED!

PC INTERFACE AVAILABLE

Call or write for details on FUSION/4 Media-Independent Retrieval/Query/Report Processor.

NEW! IBM PC program interface supports Lotus 1-2-3, Visicalc, SuperCalc and more.

FUSION
PRODUCTS INTERNATIONAL
(415) 461-4760
900 LARKSPUR L.C. #295
LARKSPUR, CA 94939
TELEX 176099

However, if a project leader had a constant staff and could develop his own standards to fit his own ideas, he would definitely prefer it that way.

Current vogue

Structured programming and design is the current vogue as far as programming and design techniques are concerned. Structured programming is, without a doubt, one of the most effective ways to ensure easy-to-follow, easy-to-maintain correct programs.

Consider, however, that nearly all the benefits for implementing such a methodology occur in the support of the resultant system — not in its development.

In fact, it will take longer (although not much longer) to develop programs with standards in place that ensure these techniques are followed.

With production support as the primary, if not only, recipient of the benefits, it only seems natural that production support should develop, maintain and enforce them.

An initial set of standards should be developed by support and proposed to the interested parties within MIS. The proposed set will undoubtedly be viewed by the development group as overly constrictive and adding too much time to its schedule.

Question the group

If the standards are not viewed as such, question the support group that prepared them. The group probably has not totally considered its needs in light of the contradictory nature of its priorities. Out of the resultant negotiation cycle will come a set of standards that should provide a manageable level of consistency from the support group's point of view, while not severely impacting development's ability to deliver a product in a reasonably aggressive time frame.

Standards must evolve to take advantage of emerging technology, new and imaginative approaches and the influx of new personnel. Production support should be the group that maintains and enhances the standards with input from all affected areas.

Typically, MIS is the least automated of any group within the company. This is because we've always given user areas higher priorities than our own needs. With a support group in place, the vehicle exists whereby the needs can be identified and prioritized to allow MIS itself to improve its internal processes. Those projects will, in most cases, take a back seat to user-driven enhancements and maintenance, but at least some slow, general progress can be achieved.

Support can easily coordinate this activity and utilize outside facilities such as co-op and contract services to accomplish the actual work. By using this type of resource, the inevitable slowdown of these efforts in response to changing economic situations and management priorities can be responded to without impacting externally visible projects.

> *There should be acceptable incentives to make the group an attractive place to work. Being woken up at 3 a.m. with a problem is not an incentive.*

Lack of resources

Any MIS director can identify a number of projects that he is confident will have a positive impact on his group's efficiency but that he has never been able to accomplish due to resource problems or the lack of a detached group to address them. This might include items such as project tracking and requesting systems, internal balancing facilities, system monitors, report distribution systems and any number of others. They have to be handled as an undercurrent to other, more visible efforts, but they should be carried forward nonetheless.

Production support is an effective organ to direct and provide these capabilities.

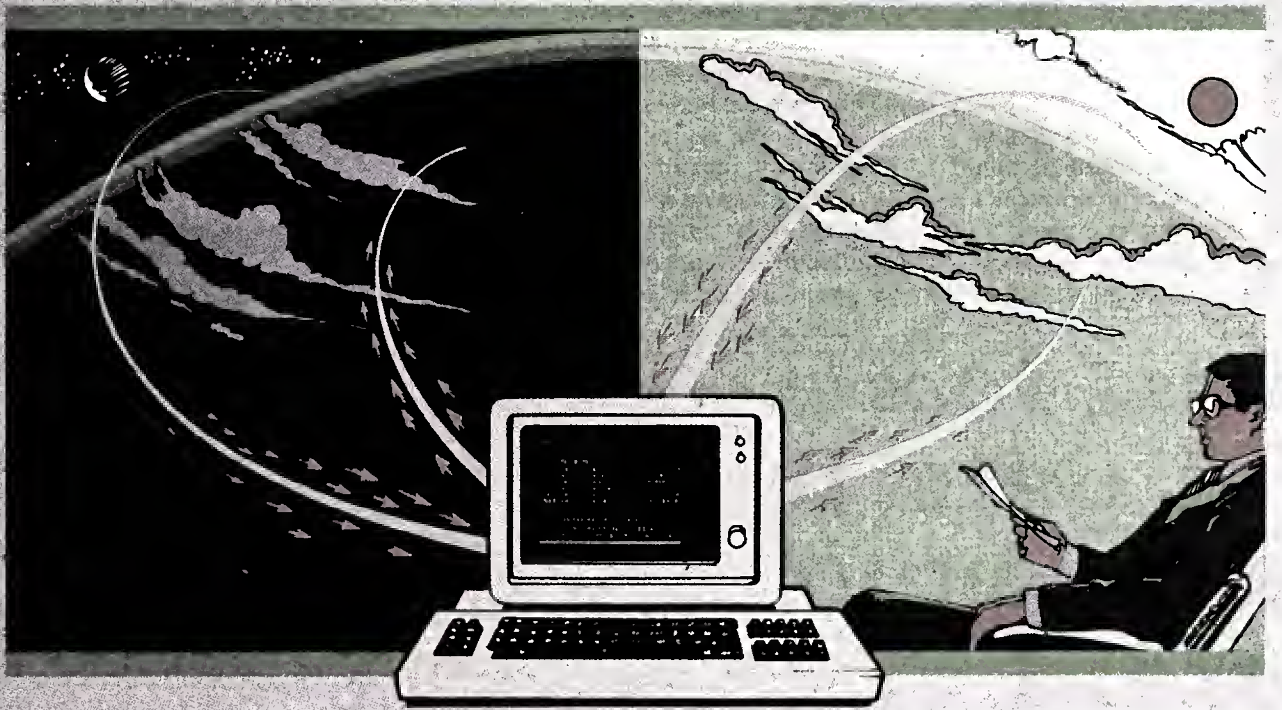
The support group is in an optimum position to judge the continued effectiveness of production systems. It sees them on a continual basis, understands the significance of enhancements to their structure and responds constantly to their instability. Support should have the authority to identify obsolete systems and require their replacement.

Project requests

This requirement is manifested in the form of project requests for new systems. These projects should be treated as any other received. At some point, support should be withdrawn should the system's capabilities atrophy to the point where maintenance becomes economically counterproductive, and no action is

Async Outdial Service

Transferring data
automatically saves
time and money



Heard about TYMNET's Async Outdial Service?

If you haven't, you may be spending more time and money on data communications than you have to.

Outdial permits you to transfer data between a host and unattended terminals and personal computers. **Automatically.**
24-hours a day—via the TYMNET public data network.

Imagine.
With Outdial, you can maximize your time and your computer power during business hours by deferring data processing and transmission to the evening when rates are much lower.

No waiting for urgent messages either. Outdial transmits them to your terminal—immediately. You don't even have to log in.

Why not maximize your time and your computer resources—and save?

For more details,
call or write for
TYMNET's
"Async Outdial Service"
data sheet.

TYMNET, Inc.
2710 Orchard Parkway
San Jose, CA 95134
(408) 946-4900

Public and Custom Data Networks

TYMNET®
A McDonnell Douglas Company

C I C S

- IPCP **opens** and **closes** CICS **files** using **batch JCL.**
- ✓many other CSMT/CEMT functions
- ✓eliminate PAUSE statements
- ✓free 30-day trial period
- ✓$1250 one-time or $63 month

sds
SOFTWARE DIVERSIFIED SERVICES
A Division of J.W. Lampi, Inc.
6401 University Avenue N.E., Suite 308
Minneapolis, MN 55432
(612) 571-9000

forthcoming from development.

The ability of the group to meet these and other challenges and responsibilities is based upon organizational authority and proper staffing.

The priorities and necessities that go into establishing an organization are extremely complex. There are really three points to consider in order to ensure success for support, at least in the area of organizational authority.

Reporting level

The first has to do with reporting level. In order for a production support group to function effectively, it must report on (or as close as possible to) the same level as systems development. This is essential since development will invariably be the group's main antagonist, and the group is meant to provide a counterbalance to that area. This counterbalance cannot be provided if the two group's management doesn't carry the same implicit and explicit weight.

The second has to do with the group's ability to influence the future planning of the organization. If you relegate support to a role where it can make no contribution to the strategic plans of the organization, it guarantees that its authority will disintegrate over time.

The third involves perceived career growth. In order to ensure the continued staffing of the group with aggressive people, there must be a path upward that climaxes at the same point as development or other competitive groups. If it climaxes at a point below development, why bother spending time there at all?

Staffing from other portions of the organization and at least a few of the personality considerations have already been discussed. There is one more point to make: how the group is staffed and leveled as far as capabilities and seniority.

> *The support group is in an optimum position to judge the continued effectiveness of production systems. It sees them on a continual basis, understands the significance of enhancements to their structure and responds constantly to their instability.*

It can be seen, based upon the previous points, that the group established for production support is going to handle much the same duties as a conventional development group — minus the long-term development projects.

The group will have contact with the users, be responsible for a substantial portion of what MIS performance is judged on and govern a degree of future application planning. Essentially, it will fill a hand-in-hand role with development as far as applications are concerned.

The production support group will also bear a considerable degree of the weight for control and administration of the conventional operations responsibility. It will be directly and heavily involved with turnover, library maintenance and application evaluation. As such, it will fill an intermediary role between development and operations.

These are no mean responsibilities. They should be entrusted only to aggressive and ambitious people interested in moving ahead in the organization and making direct and measurable contributions to the corporate future.

Matching titles

The titles and career path offered these people should match that of competitive structures. The best matching titles currently lie in development. Use precisely the same ones: the senior analyst through programmer lines — and don't qualify them. I've always felt that MIS, as a discipline, tends to overdo it in respect to job titles. We need fewer, more consistent ones — not more.

There should be acceptable incentives to make the group an attractive place to work. (Being woken up at 3 a.m. with a problem is not an incentive!)

The incentives should not be bribes. After all, we are well paid for our efforts. Provide incentives that aid in better job performance and a gain in sense of importance and contribution. Consider the following items as likely candidates.

Training. People in support should have training that encompasses the kind associated with development, operations and technical services. Video courses and seminars should be provided to ensure an adequate level of expertise.

Tools. If your staff members are supporting an application that has critical nightly runs, place CRT terminals in their homes in order for them to service those applications.

Compensation. These people will often come in at night to fix problems in a high-pressure situation. How will you compensate them: shift pay, compensation time, higher salaries?

The splitting of support and development, along with the consolidation of other duties, can yield substantial improvement in your organization. Reasonably, improvements cannot be achieved if you do not possess the raw manpower or organizational impact implicit to a medium to large-size MIS facility. Production support merely represents one opportunity where the economies of scale can be felt. As in any other area of growth, the implementation of such changes can only be successful when they are properly planned and managed.

We've touched upon an opportunity. Exercise that opportunity with care and deliberate, conscientious planning.

About the author

Robert O. Peterson is an independent consultant specializing in MIS. He lives in Cary, N.C.

DOS/VSE and CICS/VS Frustration?

BIM gets it out of your system.

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

BIM-EDIT — the editor with more than 25 significant features that ICCF can't match. NEW
BIMSPOOL — Prints output in POWER/VSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982).
BIMSPOON — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.
BIM-PDQ — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue. NEW
BIM-ODIS — Comprehensive problem analysis and display of operational CICS system.
BIMTEXT — Word processing, document composition system. Create formatted documents from free-form input.
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. Available for **OS/VS1** and **MVS** also.
BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer.
BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.
BIMDSLOG — Console Message File display. Used by computer operations and programmers.
BIMMONTR — DOS/VSE System Status, Performance Measurement, and POWER Queue display.
BIMDEVC — Displays Logical Unit assignments for physical devices, to resolve operational problems.
BIMSUBMT — On-line Job Edit and Submission facility.

BIM programs are cost-efficient, many less than $900, highest $4000. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly leases, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4331-2 system, on-site or remote.

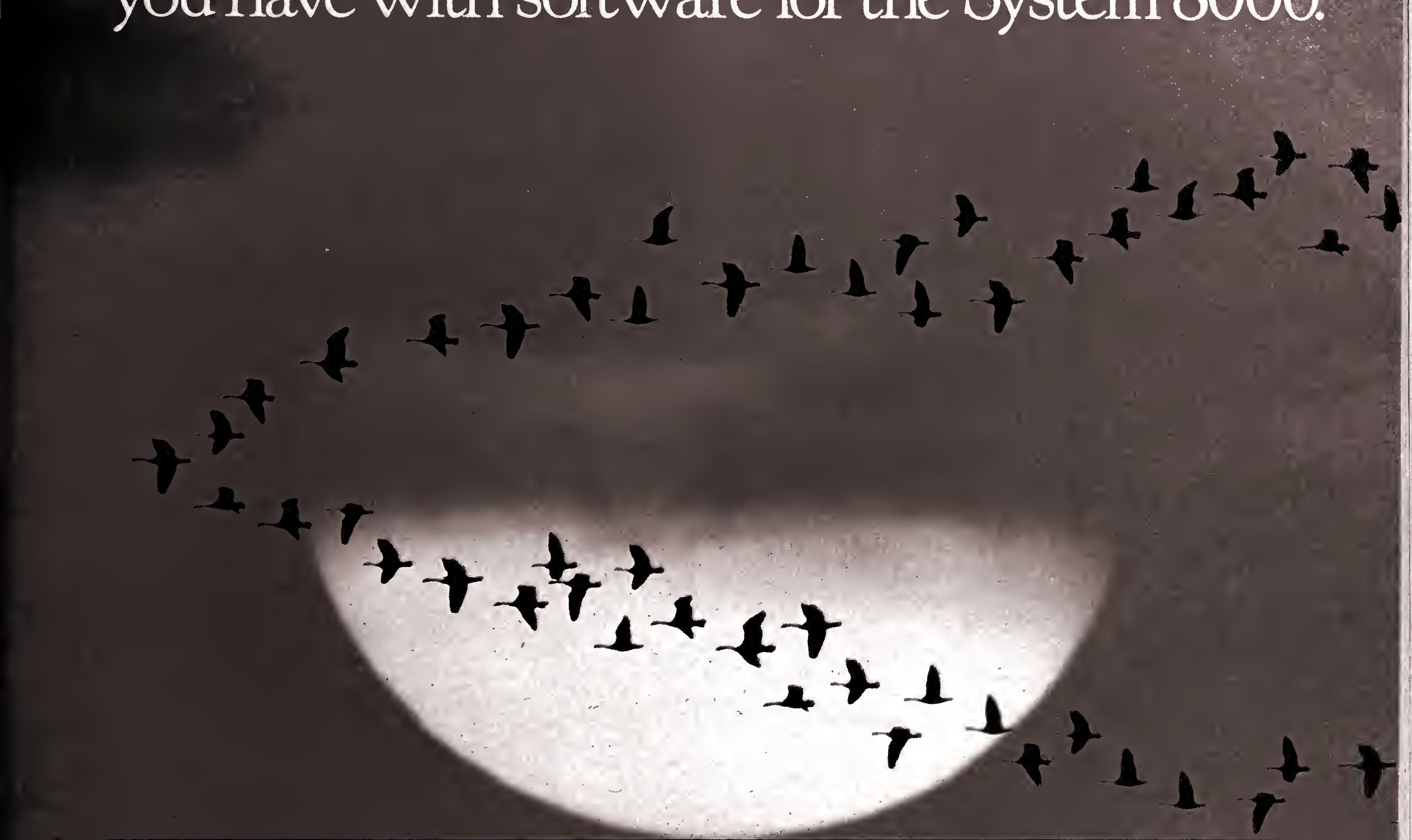
BIM
B I MOYLE ASSOCIATES, INC.
5788 Lincoln Drive
Minneapolis, MN 55436
612-933-2885
Telex 297 893 (BIM UR)
Member Independent Computer Consultants Assn.

Turns Spaghetti Code COBOL Into Structured COBOL Automatically

SUPERSTRUCTURE takes your unstructured COBOL programs and automatically produces structured COBOL programs that are easy to understand and maintain. SUPERSTRUCTURE provides a simple and cost effective alternative to manually rewriting those unstructured programs that are a maintenance nightmare. Of course you can't believe it. Let us prove SUPERSTRUCTURE works, using your programs at your location. SUPERSTRUCTURE— the breakthrough you've been waiting for. Call today: Marketing Director— SUPERSTRUCTURE.

Group Operations, Incorporated
1110 Vermont Avenue, N.W.
Washington, D.C. 20005
(202) 887-5420
Offices in Boston, Cleveland, Dallas,
Los Angeles, and New York

The freedom some birds have to migrate is remarkably similar to the freedom you have with software for the System 8000.



Moving your application program with Zilog's System 8000 is as easy as the migration of Canadian geese.

Zilog's solutions free you from the constraints of traditional systems.

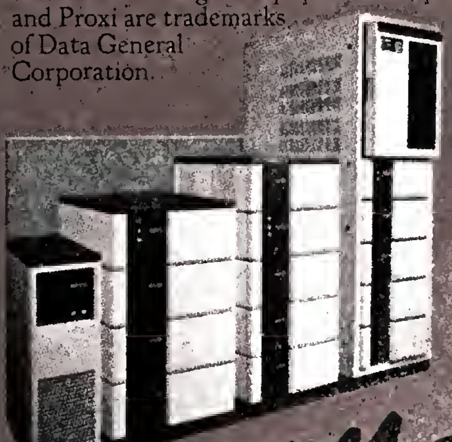
Outdated proprietary languages and operating systems limit your movement from vendor to vendor, much like the restricted flight of the albatross.

Zilog's high performance, multi-user, UNIX*-based System 8000 supermicros give you a proven way to quickly port your minicomputer software onto affordable micros. For instance, we offer compatible migration tools for Basic Four BB III, DEC® DIBOL® and DG ICOS™ COBOL and Proxi.™ And with the UNIX operating system, you can take advantage of one of the fastest-growing business opportunities in the industry.

Get a level of service, support and company stability not found from other microcomputer vendors.

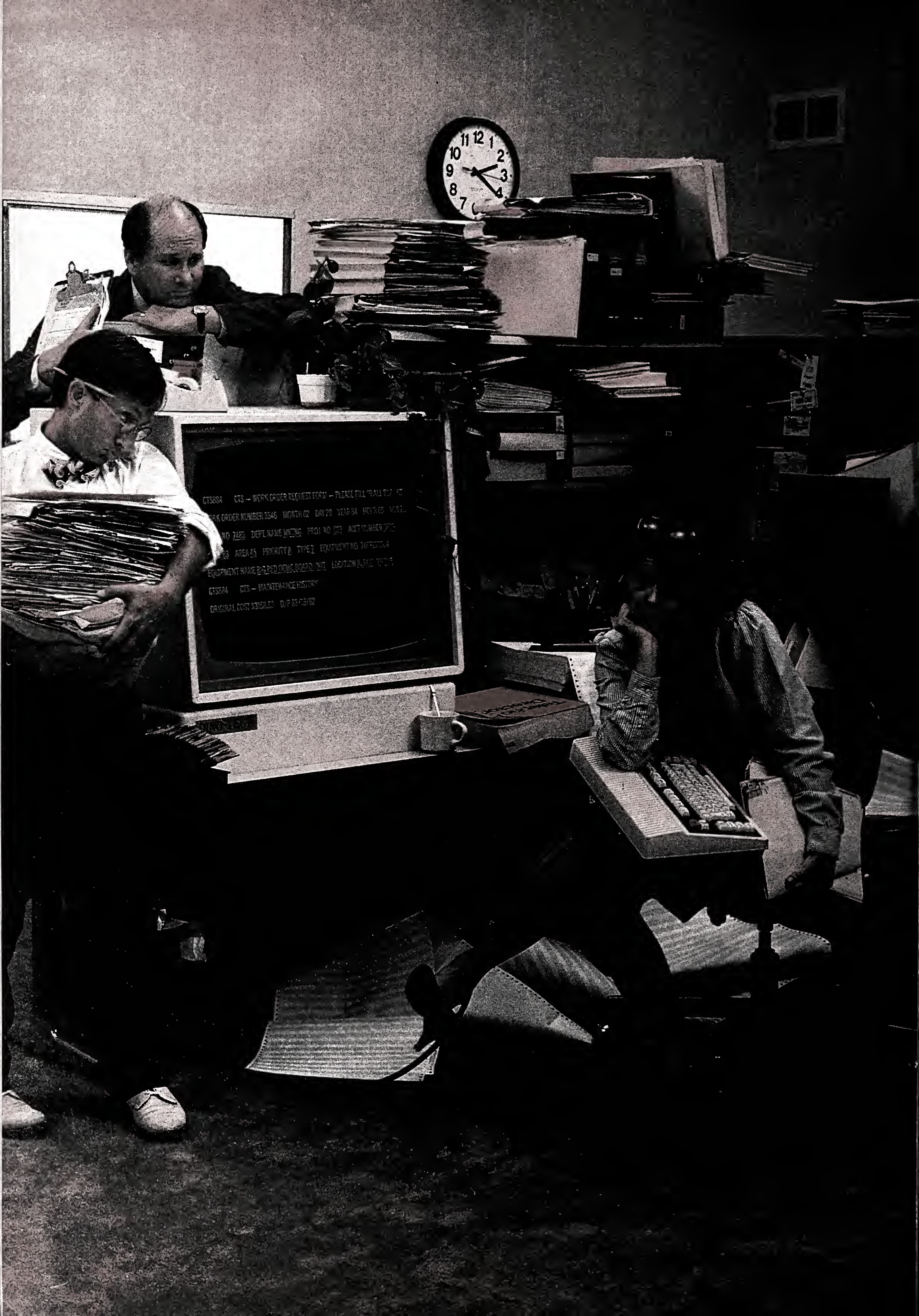
Find out what it's like to free yourself from expensive mini-computers, and get a level of service, support and company stability not found from other microcomputer vendors. Ask about our RSVP Referred Software Vendor Program, too, where you can find the applications software and tools you need as well as list your software. Zilog is also on the GSA schedule for Federal government applications.

For the whole story, call Zilog Systems Division at (800) 841-2255. Or write: Zilog Systems Division, Corporate Publications, 1315 Dell Avenue, MS C2-6, Campbell, CA 95008.



Systems
Zilog
an affiliate of EXXON Corporation

*UNIX is a trademark of Bell Laboratories. Zilog is licensed by AT&T. DEC and DIBOL are registered trademarks of Digital Equipment Corporation. ICOS and Proxi are trademarks of Data General Corporation.


CTS — WORK ORDER REQUEST FORM — PLEASE FILL
ORDER NUMBER 3546 MONTH 02 DAY 28 YEAR 84
AREA 45 PRIORITY A TYPE 2
CTS — MAINTENANCE HISTORY
ORIGINAL COST

THE WAY SOME TERMINALS TAKE OVER AN OFFICE, YOU'D THINK THEY OWNED IT.

Of course, you can't blame the display terminals themselves for being big and overbearing. Most were designed to work in the not-so-crowded office of the past.

Today, things are different. You've got a lot more people and a lot more work stations. But not a lot more room.

That's exactly why we created our unassuming little 1700 monochrome display.

The 1700 couldn't crowd a person's desk if it wanted to. Its footprint is a tiny 13 x 12 inches (24% smaller than our biggest competitor's 3178).

The unassuming ITT Courier 1700 display.

Its keyboard is smaller, too—to give your operators extra elbow room.

And its smaller price gives relief to an upper management constantly being squeezed into financial corners.

Yet, even with its tiny price, our 1700 has some immensely valuable features.

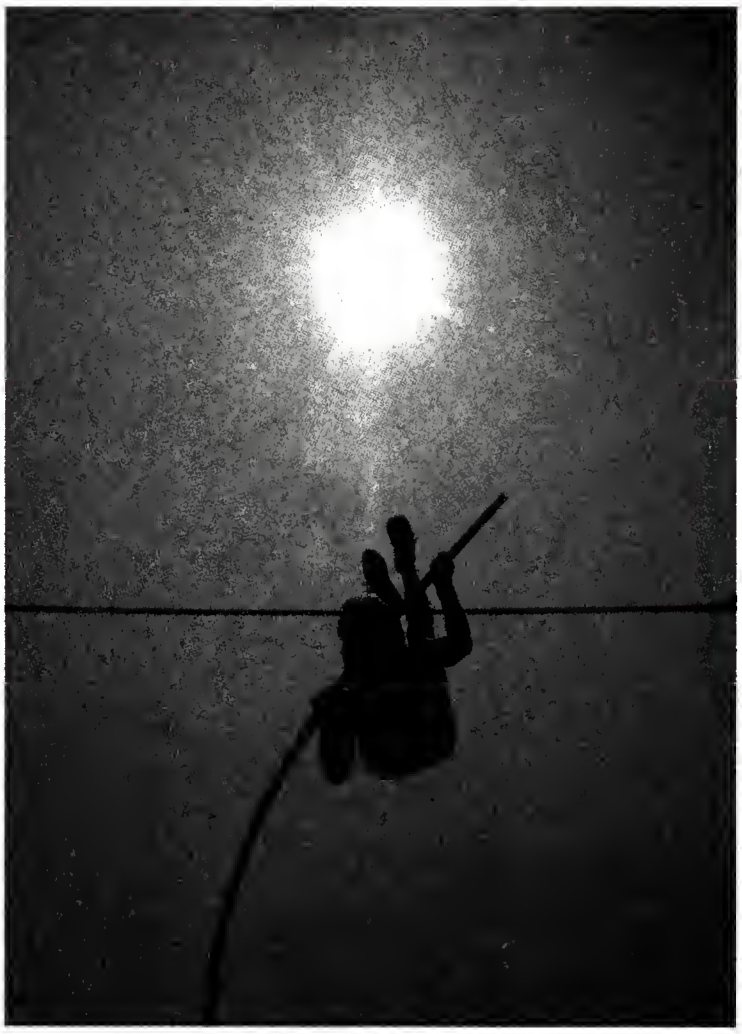
Things like a high-resolution screen just as readable as a full-size 3270 screen. Diagnostics to save you troubleshooting time. Plus a head that tilts and swivels for the best possible viewing angle.

Still, the most valuable feature of our 1700 display is the small impact it has on a person's desk. And, in today's office, that can be a big comfort.

Contact your nearest ITT Courier Representative. Or call the ITT Courier Sales Support Department at 1-800-528-1400, toll-free.

ITT
COURIER

The challenge isn't to meet the standard.
It's to set it.

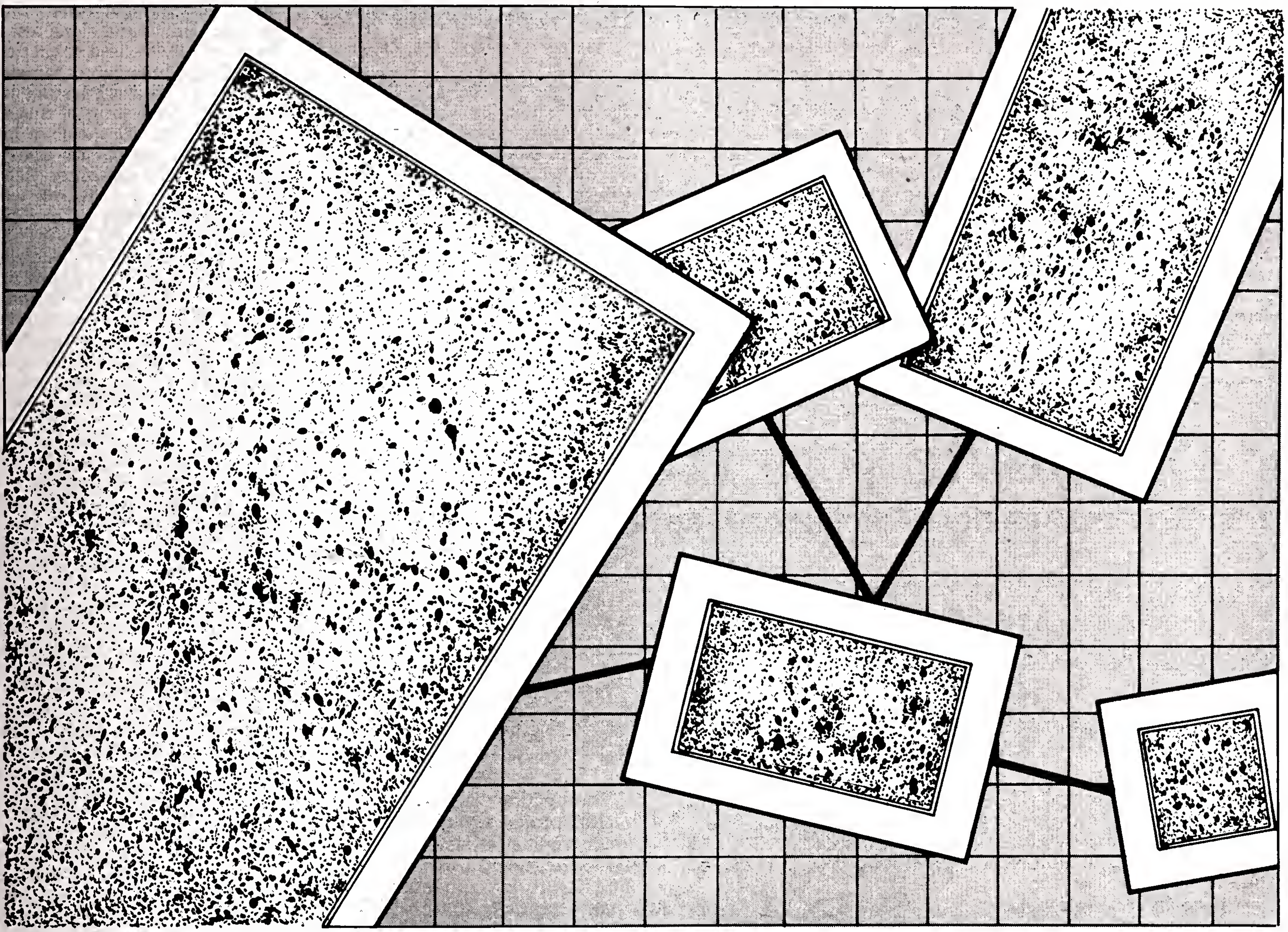


Hogan's Umbrella™
sets new standards
in large-scale
systems development.

Hogan's Umbrella is a powerful systems development tool. We designed it to make our own development faster and more productive, and to make maintenance simpler and more efficient. Now Umbrella is being used in over 120 leading DP shops. Find out how the Hogan Umbrella can help you set development standards. Call David Allen at 214/386-0020.

Hogan
SYSTEMS
5080 Spectrum Drive, Dallas, Texas 75248

IN DEPTH



Developing system code

Under TSO, a user saves time and money on two projects

By Fred Schuff

Developing Operating System Related Code (OSRC) has traditionally been very time consuming. This area of development is extremely critical and difficult because it affects almost all users of a computer system. Methodologies to improve this development cycle and the quality control of the product are the goal of most installations.

The results achieved in the projects reported here were the development and testing of OSRC code in a much shorter time (40% to 60%) with less severe restrictions imposed upon the vital resource of dedicated computer test time and development personnel. Additionally, more test time was made available to ensure the validity and integrity of the code developed.

Although the target for this effort was OSRC, there is no reason why the results could not be applied to other disciplines. The basic concepts adapt readily to many applications and provide an easy bridge for a test vehicle which will not affect normal production processing in an environment approximating reality.

> ***The goal: to develop and test operating system related code more quickly and with fewer demands on resources and development personnel.***

In many instances, all of the facilities of the full production environment need not be provided and the necessary subset of relationships and mechanisms can be effectively implemented. This subset can be very beneficial for system designers and developers for testing and parallel execution.

Even with on-line storage dump review and analysis processing programs, the process is very cumbersome from a terminal. Both represent an after-the-fact view of the environment that further complicates the problem-solving requirement.

One traditional requirement is for computer time availability for testing in a stand-alone environment. A second is the testing facilities available to the developers for this specific type of code. To alleviate these problems, or at least a major portion of them, two methodologies were devised and implemented over the course of two major development efforts. These two projects are used to exemplify the techniques developed.

The requirement for stand-alone test time is due to the necessity of interfacing with other systems functions and to obtain/modify data from other processing in the operating system components. For testing, there are severe restrictions because of the inherent protection features of the operating system.

The multithread nature of normal processing in a live system also complicates testing. This does not imply that live testing can be eliminated. But a more controlled environment tends to simplify the initial testing and eases the initial error detection and correction process. Controlling the test conditions is extremely important in developing new systems for evaluation and validation of results. Furthermore, the facilities for inserting debugging code are limited or cumbersome in a live, production-type processing. (Note, the system used in this effort was an IBM mainframe running MVS with JES2.)

The two major factors in the logistical development process of OSRC are:

1. The requirement for stand-alone test time.
2. The access to/modification of System Control Block data.

The two are related because the effects of changes to System Control Block data affects other processing in the system(s). To isolate the test environment, stand-alone test time must usually be used so that this effect will not impair other users and functions during the testing period.

The main objective of this effort was to accomplish the development of OSRC more efficiently and quickly with improved reliability. The vehicle selected to test the code was TSO (Time Sharing Option) from interactive terminals using the TSO TEST facility for debugging. Doing so allowed more test time during prime shift rather than off shift and allowed the use of shared time rather than stand-alone computer time. This had considerably less impact on the total data processing availability of the computer system(s) for all users and provided a more convenient and efficient testing medium for the system developers.

For the OSRC developers, one major time-consuming consideration is loading the "test" code via an IPL (Initial Program Load) or bootstrap loading the operating system (15 to 30 minutes). This process usually must be repeated each time a problem is encountered, analyzed and code corrected. Then the testing proceeds another one step at a time. Problem determination at each step can be simple or require a storage dump to locate the problem. This presents another time-consuming process of handling the physical storage dump (80,000 to 200,000 lines of printed output). If printed, this amounts to a significant delay.

Even with on-line storage dump review and analysis processing programs, the process is very cumbersome from a terminal. Both of these also represent an after-the-fact view of the environment which further complicates the problem-solving requirement. The mechanism which was proposed in these development efforts provided for the elimination or significant reduction of these two problems. This was accomplished by creation of a pseudo-environment which could be loaded quickly and run under a real-time, interactive debugging package.

The methodologies developed were fairly simple concepts which became a little more complex to implement. They required careful planning but are by no means prohibitive. The two basic components of this method are:

1. Development of System Drivers (or simulators) to create the external environment and provide the appearance of a normal processing system.
2. Duplication of System Control Blocks and chains in local storage areas which directly reflect the real system as it would exist in a live environment.

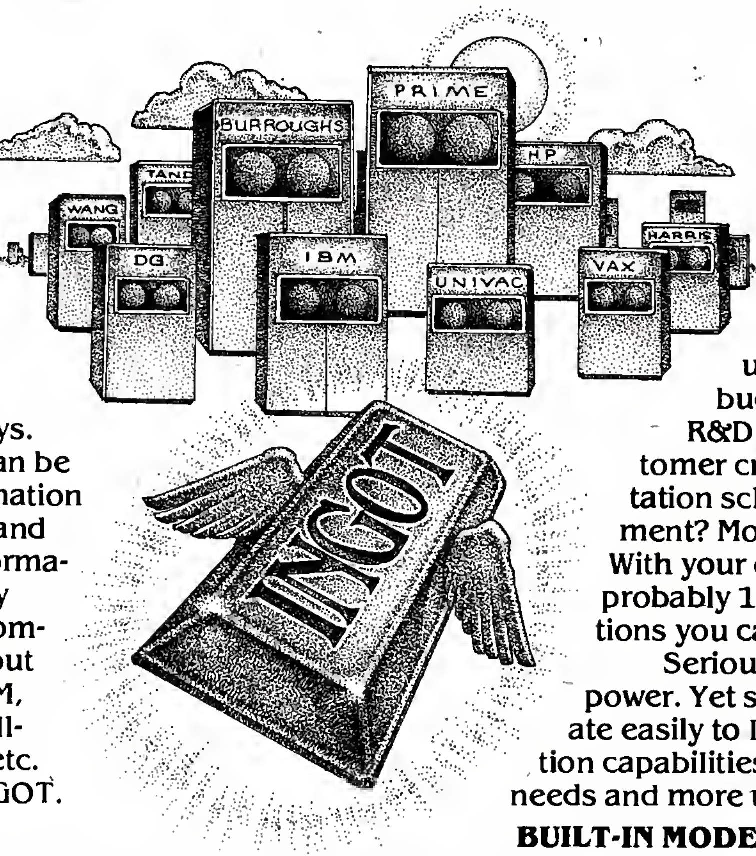
The descriptive terminology which follows relates to the IBM MVS operating system and components involved in these two specific projects. They are exemplary descriptions of the application of the two methodologies. The two projects (P1 and P2) are described below and then related to the specific tailoring of the techniques for each.

P1: Development of and enhancement to SMF (System Management Facility) Accounting/Reporting modules.

P2: Development of a Cadam (Computer-Aided Design and

Distribute your creativity.

New INGOT makes decision support applications portable.

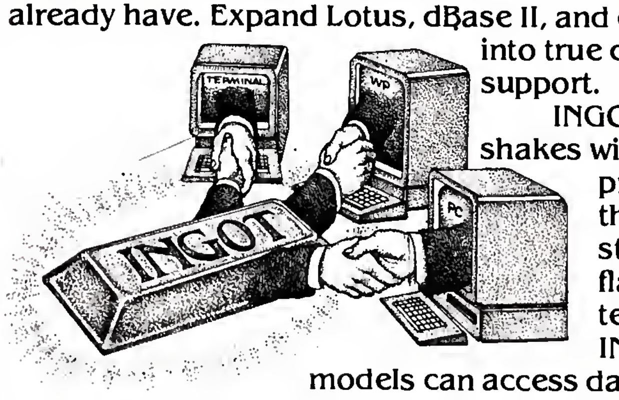


Introducing a real time decision support system—INGOT—a fourth generation language that allows you to share information in new ways.

Models and data files can be moved to almost any combination of mainframes, superminis, and minis. So, if you have an information center here, a subsidiary there, and a departmental computer somewhere else, just put INGOT on each machine. IBM, VAX, DG, PRIME, HARRIS, UNIVAC, TANDEM, WANG, etc., etc. are just alphabet soup to INGOT.

PC TALK

PC's and WP's talk to INGOT *without* special software. Upload and download. Move models and data files with ease using the same software you already have. Expand Lotus, dBase II, and calcs into true decision support.



INGOT handshakes with other programs through a standard flat file interface. INGOT models can access data base systems, pass data to color graphics programs, and execute programs in other languages. INGOT amplifies your existing software assets.

SIMPLY POWERFUL

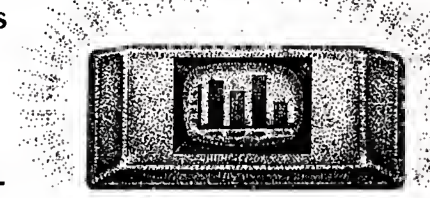
English-like commands do time series forecasting, Monte Carlo simulation, simultaneous equations, LP optimization, statistical curve fitting, and more. Sales forecasting and optimal manufacturing scheduling can be integrated into a single model using INGOT.

What's your application? Financial consolidation? Long range forecasting? Employee evaluation? Departmental budgeting? Spread sheets? R&D project selection? Customer credit analysis? Transportation scheduling? Cash management? Monitoring competition? With your creativity, there are probably 10,000 portable applications you can build in INGOT.

Serious model builders love its power. Yet spread sheet users graduate easily to INGOT's fourth generation capabilities. INGOT satisfies more needs and more users with the same DP$.

BUILT-IN MODELS & GRAPHICS

Proprietary models are built-in as single commands to save users time. From replacement value accounting to stock price estimation, there's nothing like INGOT.



Draw a floor plan and insert cost estimates. Draw a map and show sales by region. Ordinary pieplots, lineplots, Gantt charts, and bar graphs are one line commands.

HELP+

100% of the user's manual with 200+ examples can be accessed on-line by typing HELP. Add your own HELP messages to the system too. User training, consulting, and hot line support assure your success.

ACT NOW and call or write for more information.
800-323-7820 or 312-869-5556.

SCHONFELD & ASSOCIATES, INC.
COMPUTER SOFTWARE—COMPUTER BASED PUBLISHING—
MANAGEMENT CONSULTING
2550 Crawford Avenue Evanston, Illinois 60201

INGOT

A COMPREHENSIVE DECISION SUPPORT SYSTEM

INGOT was developed by Schonfeld & Associates, a 7 year old consulting firm. SAI customers include about half the Fortune 500. INGOT was designed from experience and has been used as SAI's internal tool for years.

Lotus is a trademark of Lotus Development Corp.
dBase II is a trademark of Ashton-Tate.

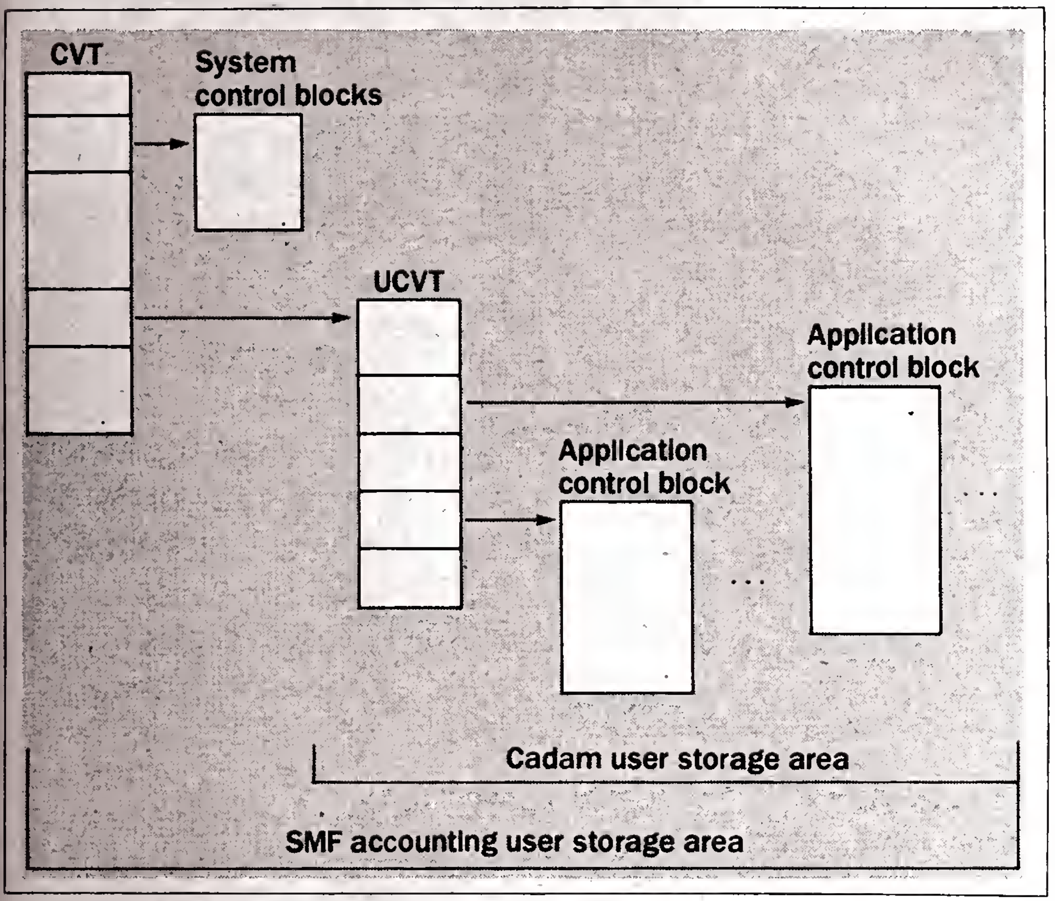


Figure 1. Control blocks in the user area

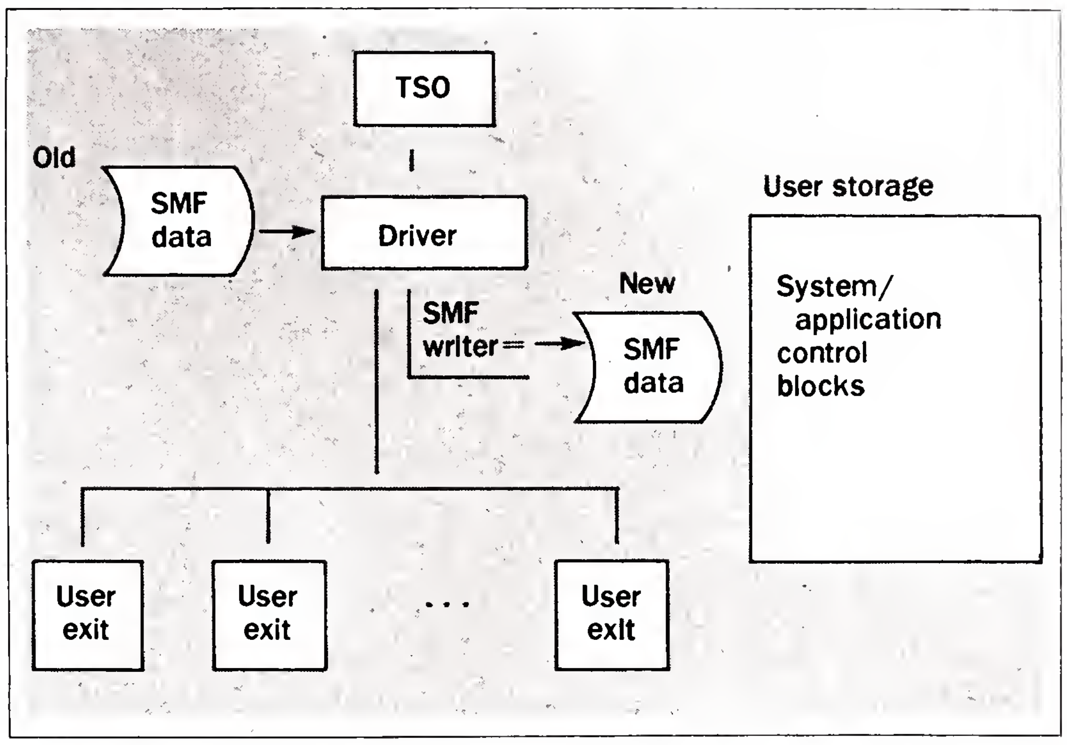


Figure 2. SMF Accounting System structure.

Manufacturing) Monitor to manage multiple Cadam processing jobs from another independent job in the system.

System Drivers

System Drivers (simulators) are programs which present a pseudo environment to simulate, as closely as possible, in a controlled atmosphere, the real processing environment which exists when executing a production system.

P1) The SMF Accounting/Reporting System driver provided the following general control and utility facilities:

A. SMF Record Controller to route SMF records created by the normal system processing to the SMF user-written exit routines in the proper sequence. These records were collected from normal SMF processing on a selected set of jobs which were extracted from the SMF SYS1.MAN-files.

B. Provided a Dummy SMF Record Writer routine to direct the selected and newly generated records to the user's SYS1.MAN-file. This kept the output segregated from normal SMF data, and, therefore, the test SMF processing had no effect on the live SMF Accounting/Reporting system.

C. Loading the proper SMF test modules to process the SMF records. This provided for modification of individual exit routines while continuing to access unmodified code which was required for the proper sequence of processing of the SMF data. Only the modified code needed to be moved to the test libraries.

D. Controlling the access to System Control Blocks to the user created areas and chains rather than the real System Control Blocks and data areas.

P2) The Cadam Monitor driver provided the following functional capabilities and functions:

A. Simulate the execution of one or more Monitor jobs as subtasks under the driver.

B. Oversee the status of these tasks and report to the pseudo operator's terminal that status.

C. Provide the proper System Control Blocks and chains in the local storage area for each Monitor and lower levels of submonitors.

Control block duplication

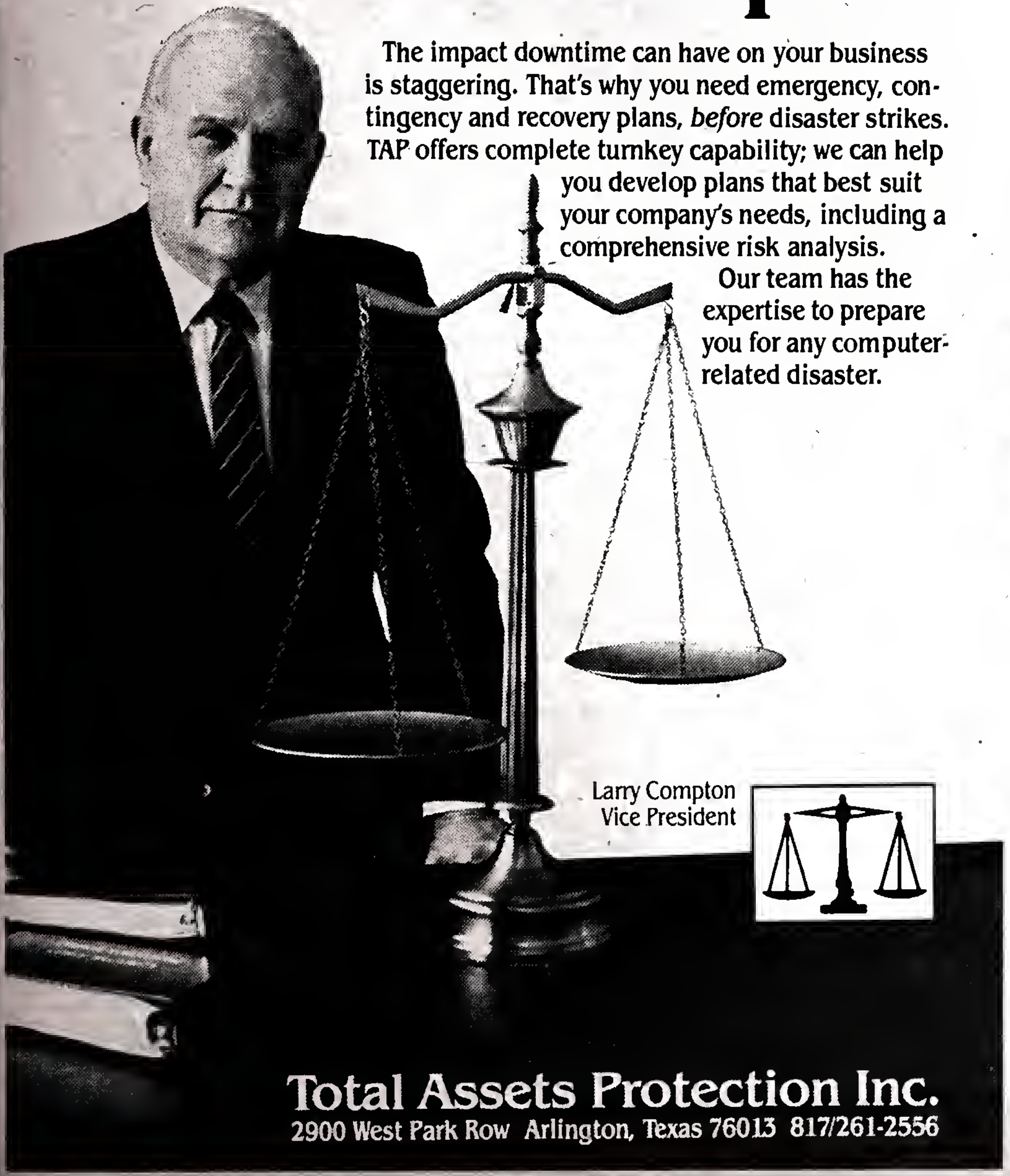
The Control Block Builder was responsible for the creation of Systems Control Blocks and user-defined Control Blocks for specific applications in the local storage pool for reference under the test environment. These control blocks could then be modified without affecting the real control blocks and other processing

The scheme used the CVTUSER field in the IBM CVT (Communication Vector Table) Control Block as a head for the chains of control blocks to be duplicated or built. The CVTUSER pointed to the UCVT (User Communication Vector Table) in which additional data and pointers to other control blocks were stored. The UCVT is a local control data and fields for OSRC local code.

By duplicating the CVT and the UCVT pointer in local storage, the complete chains can be accessed without any effect on the real control blocks. The only consideration is the original pointer to the CVT in the local storage pool. Those chained blocks that are to be modified are placed in the local storage pool. The control blocks that are just referenced can be left intact, and the pointers can be to the real data without adverse effects.

There were several differences in the control block structures built for each of these two systems:

P1) The SMF Accounting/Reporting System control block builder created was required by the processing code. The chain began with the CVT, chained to the UCVT and then to a


Don't wait for disaster to strike before you have a plan.

The impact downtime can have on your business is staggering. That's why you need emergency, contingency and recovery plans, *before* disaster strikes. TAP offers complete turnkey capability; we can help you develop plans that best suit your company's needs, including a comprehensive risk analysis.

Our team has the expertise to prepare you for any computer-related disaster.

Larry Compton
Vice President

Total Assets Protection Inc.
2900 West Park Row Arlington, Texas 76013 817/261-2556

IMSADF II Users — Get A Grip!

Don't get carried away with ADF before you know how to use it right!

DKI's one week ADF class covers a wide variety of topics including: standards, procedures, usage guidelines, design methodology, coding techniques, testing, performance considerations and problem solving.

This class is a must for ADF Designers & Coders, Systems QA Personnel, DBA's, Performance Tuners and Project Managers.

The next offering is July 23 in San Francisco. For information on upcoming classes or our in-house ADF class, contact: Data Knowledge, Inc., P.O. Box 1482, San Bruno, CA (415) 872-3600.

WHEN A PERSONAL COMPUTER ISN'T ENOUGH, YOU NEED A PERSONAL PDP-11.

NOW YOU CAN HAVE DIGITAL'S PERSONAL PDP-11'S RUNNING PDP-11 AND VAX-COMPATIBLE SOFTWARE ON YOUR DESK.

You know who you are. You've been doing a major part of your work using a terminal connected to a PDP-11™ or VAX™ system. Your applications are as wide-ranging as your knowledge. Theoretical physics, real-time data analysis, statistics, financial modeling, CAD/CAM, process control – there's very little that's beyond the reach of your professional experience.

Like most users, you're very satisfied with the services you've been getting from your PDP-11. You've come to rely on them, in fact. And you're not willing to give them up for just a personal computer. What you really want is a full-powered minicomputer dedicated exclusively to your work.

If you're this type of user, Digital has exactly the computers you need: the Professional™ 300 Series, our personal PDP-11's. They're engineered to give you the minicomputer power and sophistication you've come to expect – in a personal com puter size, and at a personal computer price.

RICH PDP-11 DEVELOPMENT ENVIRONMENTS AT YOUR COMMAND.

Digital's Professional 300 Series, the best-engineered desktop systems for computer-experienced professionals, offer you a choice of minicomputer-powered operating systems.

First among these is P/OS,™ the Professional Operating System. A single-user, multi-tasking version of RSX-11M-PLUS,™ it gives you capabilities that far exceed typical personal computer software. Its complement of compiler languages includes BASIC 11, DIBOL, COBOL-81, Pascal, FORTRAN-77, and WHITESMITH C. What's more, a Native Tool Kit and a rich selection of editors, debuggers, task builders, forms management and sort utilities helps you achieve the high programming productivity you've come to expect from a minicomputer. The UCSD-p System™ is available as an alternative development environment under P/OS. Plus, P/OS lets you use Digital Classified Software, a portfolio of proven applications such as TK! Solver,™ a high-performance equation-solving tool, and RS/1,™ an industry-standard laboratory research system.

Next, there's PRO/RT-11,™ a single-user, multi-tasking, real-time version of the RT-11 operating system that's so popular in technical OEM PDP-11 applications. There's also the STANDARD MICRO MUMPS 300™ System. And for commercial applications there's the CTS 300™ system, which features RT-11 DIBOL portability.

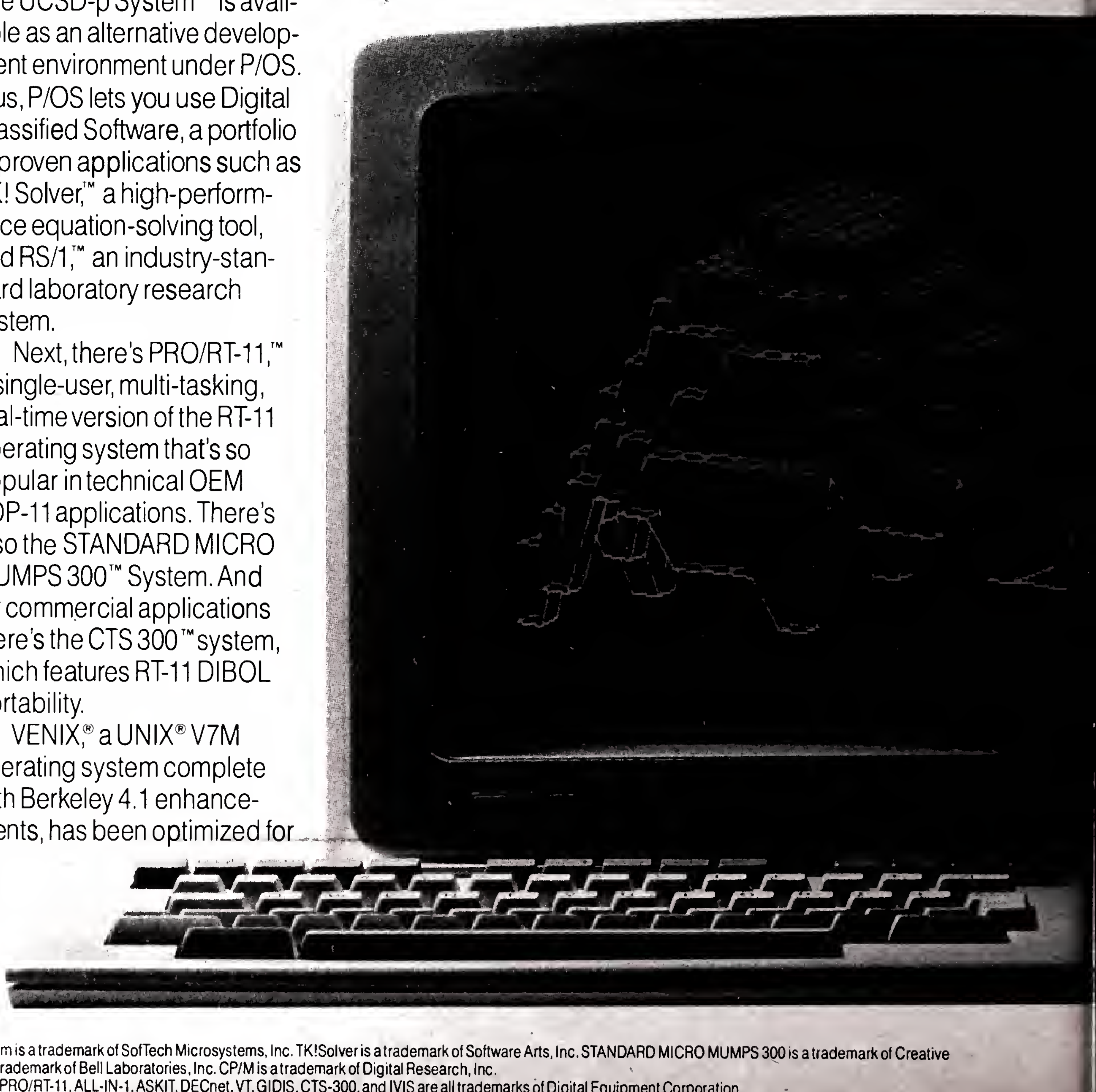
VENIX,® a UNIX® V7M operating system complete with Berkeley 4.1 enhancements, has been optimized for the Professional Series. It even includes a UNIX System 5 software license, demonstrating our commitment to keeping the Professional current with future UNIX directions.

MINICOMPUTER STRENGTH APPLICATIONS. ON THE SHELF. READY TO GO.

The reason we've engineered the Professional with a variety of operating systems isn't just to let you write your own minicomputer-powered programs. It's to let you access a vast library of proven, developed PDP-11 and VAX RSX programs, and run them independently on your Professional.

Many third-party PDP-11 and VAX RSX applications – or the ones you're using now – can be transported to your Professional. You can use the same files, the same commands. This puts an incredible variety of scientific, industrial, technical and commercial solutions at your disposal.

Just as important, you can attach a real-time interface to the Professional to adapt it for scientific and industrial use. And you'll have a wide variety



C Compiler is a trademark of Whitesmiths, Ltd UCSD-p System is a trademark of SofTech Microsystems, Inc. TK!Solver is a trademark of Software Arts, Inc. STANDARD MICRO MUMPS 300 is a trademark of Creative Socio-Medics. VENIX is a trademark of Venturcom. UNIX is a trademark of Bell Laboratories, Inc. CP/M is a trademark of Digital Research, Inc.
Professional 300 Series, PDP-11, VAX, P/OS, RSX-11M-PLUS, PRO/RT-11, ALL-IN-1, ASKIT, DECnet, VT, GIDIS, CTS-300, and IVIS are all trademarks of Digital Equipment Corporation.

of printers, plotters, and special purpose peripherals to choose from.

A TRUE DISTRIBUTED OFFICE WORKSTATION ON YOUR DESK.

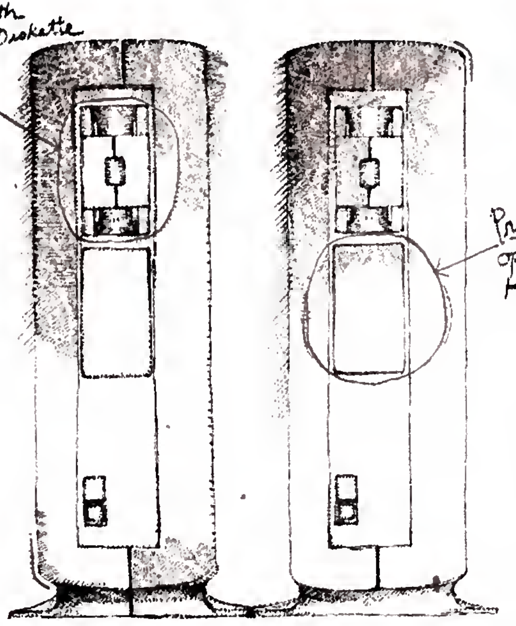
The Professionals acknowledge the fact that you work in an office as well as in a lab, offering Pro Office Workstation, the Professionals' version of Digital's ALL-IN-1™ software, the best-engineered office automation system you can buy. Running in conjunction with a VAX host, ALL-IN-1 gives you word processing, automatic spelling verification, electronic filing, electronic mail, calendar management and more. And that can increase productivity organization-wide.

Office automation tools designed for independent use on your Professional include Digital's ASKIT™ software, which provides business graphics, personal database, word processing and spreadsheet functions, plus a game. And with the optional CP/M® Softcard, you can run a variety of CP/M-80 packages on your Professional.

ETHERNET/DECNET LOCAL AREA NETWORKING TODAY.

The Professional 300 Series supports a variety of networking options. Foremost among these options is DECnet,™ which lets your Professional serve as a distributed workstation with PDP-11 and VAX processors. And, DECnet gives you a choice of local and wide-area communications devices, including 10 Mb/sec Ethernet, with full support for V2.0 standard (IEEE 802.3 specification); public packet-switched X.25 networks; and standard telephone lines.

And by virtue of its compatibility with PDP-11 and VAX RSX software and RMS file structures, the Professional lets you download remote files from your PDP-11 or VAX to your Professional, all transparently to the user and the program. Or, if you wish, your Professional can emulate Digital's VT™ terminals.



Pro 325 with 800K Dual Diskette Drive

Pro 350 with optional 10Mb Hard Disk

The Professional doesn't leave out the rest of the world, either. Device emulation includes IBM 3270, 2780/3780, 3277, and more.

THE LEADING GRAPHICS WORKSTATION IN ITS CLASS.

If you only want to portray simple X-Y values, lots of personal computers can do the job. But if you need a way to graphically display thousands of information variables, there's no finer tool available than a Professional. It gives you a palette of 4,096 colors to work with. State-of-the-art graphics architecture, like GIDIS,™ a virtual device interface, helps you design fast graphics for your programs, while allowing them to run independently of future hardware enhancements. Industry-standard graphics application interfaces are also available. And the Virtual Device Meta file capability lets you integrate text and graphics in a single file under P/OS 2.0. Just as important, the quality of Professional 300 graphics is unsurpassed. The bit mapped screen provides a 960 x 240 pixel resolution. And Digital's IVIS™ Interactive Video System is available for advanced program development.

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

The Professional 300 Series, like every Digital hardware and software product, is engineered to conform to an overall product plan. This means Digital systems are engineered to work together easily and expand inexpensively. Only Digital provides you with a single, integrated computing strategy from desk top to data center.

For more information on Digital's Professional 300 Series systems, the Professional 325 and the Professional 350, call 1-800-DIGITAL, ext. 690. Or send the coupon or write: Digital Equipment Corporation, Attn: Mr. Dennis Coady, 200 Baker Avenue, West Concord, Massachusetts 01742.

I'd like more information on Digital's Professional 300 Series, the Personal PDP-11's:

☐ Please send a copy of your new Professional Series Handbook.

☐ Please have a sales professional call with complete information.

Name

Title

Company

Address

City

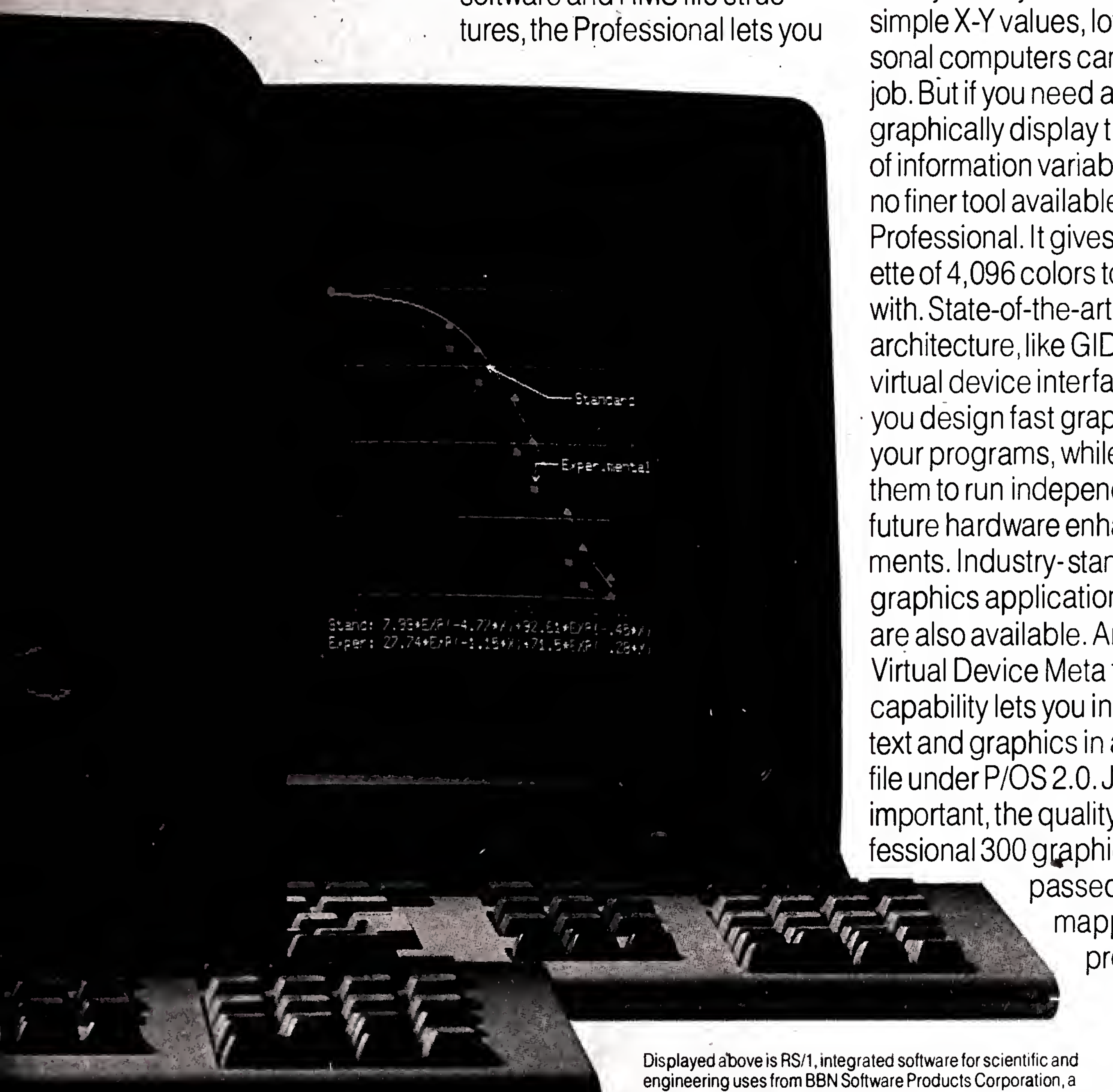
State Zip

Telephone Ext

Return to: Digital Equipment Corporation, Attn: Mr. Dennis Coady, 200 Baker Avenue, West Concord, MA 01742.
Media Code: N.

THE BEST ENGINEERED COMPUTERS IN THE WORLD

digital™



Displayed above is RS/1, integrated software for scientific and engineering uses from BBN Software Products Corporation, a subsidiary of Bolt Beranek and Newman Inc.

© Digital Equipment Corporation 1984.

The TeleVideo PC compatibles. The best hardware for the best software.

TeleVideo versus IBM. Make a few simple comparisons and you'll find there is no comparison.

RUNS IBM SOFTWARE.

With the TeleVideo® IBM Compatible line—PC, XT and portable computers—you'll get the most out of all the most popular software written for the IBM® PC—more than 3,000 programs.

Because every TeleVideo Personal Computer offers the highest level of IBM compatibility on the market and has the standard — not optional—features you need to take full advantage of every job your software can do.

THE BEST HARDWARE FOR THE BEST PRICE.

Features	Tele-PC	IBM PC	Tele-XT	IBM XT
Monitor	YES	OPTIONAL	YES	OPTIONAL
Screen Size	14″	12″	14″	12″
Tilt Screen	YES	NO	YES	NO
Quiet Operation	YES (NO FAN)	NO	YES	NO
Memory	128K	128K OPTION	256K	256K OPTION
Graphics Display (640 x 200 resolution)	YES	OPTIONAL	YES	OPTIONAL
Printer Port	YES	OPTIONAL	YES	OPTIONAL
Communication Port	YES	OPTIONAL	YES	YES
MS™DOS/BASIC®	YES	OPTIONAL	YES	OPTIONAL
System Expansion Slot	YES	YES	YES	YES
RGB and Video Port	YES	OPTIONAL	YES	OPTIONAL
Typical System Price	**$2995**	**$3843**	**$4495**	**$5754**

Study the chart below. It proves that TeleVideo—not IBM—offers the best hardware for the best price.

Note that TeleVideo's ergonomic superiority over IBM extends from fully sculpted keys and a comfortable palm rest to a 14-inch, no glare screen that tilts at a touch.

THE BEST MICROCHIPS.

What is perhaps most impressive about the TeleVideo IBM PC Compatible can be found deep within its circuitry. We use the same 8088 central processing unit that runs an IBM PC. But we also employ new VLSI (Very Large Scale Integration) micro-chips that are designed and built exclusively for TeleVideo. These interface more efficiently with the powerful 8088 and yield numerous benefits.

For example, our tiny custom chips do the work of many of the larger, more expensive circuit boards in an IBM PC. So we can offer a computer system that comes in one attractive, integrated case, is ready to run and occupies less desk space. A computer that edges out IBM's added-cost component system for reliability, ease of service and purchase simplicity.

Fewer circuit boards to cool also allowed us to eliminate the noisy, irritating fan IBM and most other PCs force you to put up with. And TeleVideo compatibles accept any IBM hardware options without modification.

THE BEST PORTABLE FOR THE BEST PRICE.

Features	TPCII-S	IBM PC
High Capacity Storage	Yes	Yes
Quiet Operation	Yes (No Fan)	No
Display	Yellow	Amber
Memory	256K	256K
Graphics	Yes	Yes
Communications Port	Yes	Optional
Printer Port	Yes	Optional
MS™-DOS 2.11	Yes	Optional
Typical System Price	**$2395**	**$3130**

THE BEST LINE.

But the Tele-PC is only one element of the TeleVideo IBM PC Compatible line.

The TeleVideo XT is the best hardware for users of popular IBM XT software who would appreciate an extra 10 megabytes of storage capacity along with the advantages listed on the chart at the left.

As the chart above demonstrates, our portable IBM compatible computer, the TPC II, is far and away better hardware than IBM. Better hardware—standard—at a better price.

THE BEST MANUFACTURER.

The TeleVideo IBM PC Compatible line is made by the world leader in multi-user computer systems and the number one independent manufacturer of terminals.

Call 800-538-8725 for the dealer nearest you. In California, call 800-345-8008.

Before you invest, make a few simple comparisons. You'll find that TeleVideo—not IBM—has the best hardware for the best software. At the best price.

IBM is a registered trademark of International Business Machines. MS is a trademark of MicroSoft Corporation. GW Basic is a registered trademark of MicroSoft Corporation.

TeleVideo®
Personal Computers
TeleVideo Systems, Inc.

set of Accounting control blocks. Several of the MVS Control Blocks were duplicated (such as the ASVT (Address Space Vector Table) to accommodate the job processing simulation code. The data areas for creation of user SMF records were created and written to the test SMF file.

P2) The Cadam Control Block Builder was very similar to the SMF counterpart. This time the chain began with the UCVT and was isolated to Application Control Blocks only in local storage.

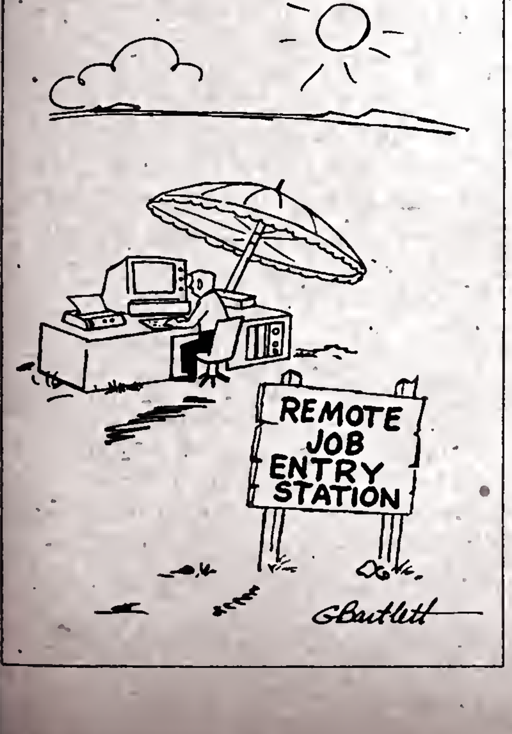
The Cadam application vector table (CadamVT) was duplicated, as well as some of the control blocks from the SMF System to provide the interface testing for Cadam Accounting modifications.

In both environments, many of the control blocks that were to be modified were in protected storage or contained critical system information. Asnoted above, the UCVT held data/pointers for both the SMF and Cadam routines. Changes to these areas would affect other processing if testing were done on a live system.

About 90% of the development and testing was done under the pseudo environment of this methodology. The remaining 10% was done using the conventional stand-alone test time procedures. The testing was often done with more than one developer testing at the same time, which would have been difficult or impossible with stand-alone test time. Obviously, this was very beneficial for the scheduling of testing and the shortening of development schedules.

The structure of the test systems for these systems is shown in Figures 2 and 3. The design was originally conceived by Paul Horak for the SMF Accounting Project and later expanded and carried across to the Cadam project. In both cases, the concept is identical. The Cadam system added the requirement to simulate the interaction of multiple jobs in the system rather than just a sequence of processing modules in an ordered fashion.

These techniques can be applied across various development efforts. They were designed to isolate the solutions being developed to the immediate resources of the testing envelope and not affect other development or concurrent processing. This isolation of a system allows greater flexibility in testing and development within the normal bounds of the facilities that are available in greater abundance and thereby improve productivity on those projects.



About 90% of the development and testing was done under the pseudo environment of this methodology.

A certain, yet limited, amount of unique code must be installed for the "test" processing in the pseudo environment. This code provided the access to the duplicated control blocks and data areas that have been created.

The code is usually very small because the sequence of chaining to access this data usually begins with one common point where all of the changes have to be centered. For example, if the UCVT is the chain starting point, all code to load the address of the UCVT will be changed, but the remaining code will be left intact.

Some code in the processing modules will also have to be modified for the "test" mode. Certain functions are simulated with other techniques, and this simulation will have to be considered. For example, in the Cadam System, the Cross-Memory Post from address-space to address-space had to be changed to normal ECF Post(s) for the simulated environment of subtasks rather than separate jobs. There are usually few of these, but they must be identified and handled for proper processing.

Two techniques were used for the insertion of code unique to the testing environment. In the SMF Accounting System, the code was conditionally added using a parameter passed to the Assembler (SYSPARM-(TEST)). The effect was to insert "test" code into the module when assembled for testing. When assembled without the "test" option, this code was omitted from the modules. In the Cadam Monitor System, the drivers passed a parameter to the code to indicate "test" mode processing, and the "test" code was permanently part of the modules. The "test" flag was passed throughout the system to activate special "test" code for both interfacing to the pseudo environment and to activate special trace code.

The Goal News

For CICS Security

ALERT BEATS DISASTER (or SAFE Beats SORRY)

ALERT/CICS™ Protects CICS Facilities

Users have found the security facilities built into CICS to be only partially effective. ALERT/CICS is the answer for complete security. Without changing user programs, one can secure transactions, programs, files and maps. ALERT/CICS will secure fields from being displayed or, if display is authorized, from being changed by an operator.

Other facilities in ALERT/CICS, rarely found in other on-line security software include:

❋ A practical system for implementing complete security hierarchy throughout an on-line environment.
❋ Random generation of passwords.
❋ Automatic distribution of passwords.
❋ Complete security for DL/1 databases.
❋ System, terminal, and operator security.
❋ Security definitions by time-of-day and day-of-week.
❋ Automatic clearing and sign-off of unattended terminals after a specific amount of time.
❋ Complete audit trail logging facilities which may be displayed through both batch and on-line reports.

Expanding On-line Usage Causes New Concerns For Integrity of Computerized Information

In 1981, a study by Hubbard Research revealed that "overall confidence in security provided by CICS is minimal... and that CICS users feel the system's security provisions are inadequate for an expanding on-line usage." Since that time, software advances have brought thousands of additional end-users and hundreds of new remote locations into the on-line environment.

In addition, with more companies merging today than ever before, the consolidation of computer facilities has created different kinds of on-line security concerns from those experienced in the past.

The solution to modern CICS security needs is a system which can handle the entire on-line environment:

❋ System resource security to control transactions and inquiry/update of files.
❋ Terminal resource security to decrease exposure to unauthorized usage.
❋ Operator resource security to positively identify who is using the system, control that usage, and record any unauthorized activity.
❋ Specific information security, whereby information may be "profiled," and, if retrieved by an unauthorized person, will appear encrypted.
❋ Advanced security facilities that provide user exits to allow the system to be absolutely custom-tailored to the installation with special needs.

ALERT/CICS from Goal Systems International contains all of the above facilities. In addition, it is easy for security administrators to use. It is totally flexible, in that various modules of the system may be adapted to various parts of the on-line environment. It is an excellent auditors' tool, as it records any and all attempted violations of security procedures; eight reports are available to monitor all ongoing activity. And, ALERT/CICS is simple to install.

Security System Adds New Depth to Goal Systems XP Product Line

With the addition of ALERT/CICS, the Goal Systems International product line has expanded beyond basic systems and performance products into a full line of CICS-based products.

Denny Yost, National Sales Manager for the XP product line said, "Since 1975, Goal has been a leading developer and marketer of software products. ALERT/CICS represents the first in what will be a series of products to expand those capabilities into the CICS environment.

"We are known as a responsive company, one with technically sound products backed up by reliable support. We are excited to be able to put our resources solidly behind the CICS user base."

ALERT/CICS is good news for any CICS installation concerned about on-line information security. It is one of the Extended Productivity Systems from Goal Systems International and is available for a free trial. For more information, call Goal Systems toll-free today at

800-848-4640 (In Ohio 800-628-4640).

Goal Systems

Goal Systems International Inc.
5455 N. High Street
Columbus, Ohio 43214-1193
Phone (614) 888-1775

© 1984, Goal Systems International Inc.

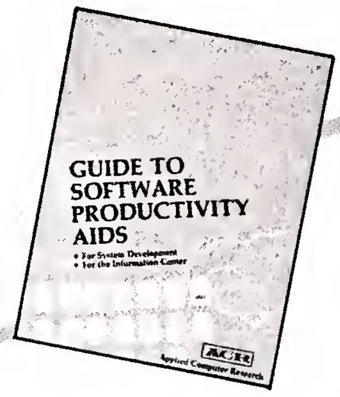
GUIDE TO SOFTWARE PRODUCTIVITY AIDS

A directory of software tools available commercially that will help improve the productivity of your system development efforts.

- Over 740 products
- 22 classes
- Cross indexed
- Semi annual

- For System Development
- For the Information Center

The Guide is organized in such a way that you will be able to locate what you need quickly and easily, and product descriptions provide you with a concise explanation of what each package does.



Please send more details

NAME TITLE
COMPANY
ADDRESS
CITY/STATE/ZIP
PHONE

ACR
Applied Computer Research, Inc.
P.O. BOX 9280 • PHOENIX, AZ 85068 • (602) 995-5929

Seeing your data resource under control begins with sending the coupon.

Chances are, your organization's data and information systems are getting out of control.

It's no wonder. The proliferation of information delivery systems and new, structured methodologies has made it easier to respond to increasing end-user demands with short-term solutions. Solutions that have only compounded the problem.

MANAGER SOFTWARE PRODUCTS' DATAMANAGER® offers a permanent solution. One that's fully compatible with your IBM mainframe environment now, yet one that will let you cope with a continuously changing systems environment and growing end-user demands in the future.

DATAMANAGER is the world's leading data resource management system. The first such system designed specifically to help you develop, manage and control your entire data resource. The first system to converse with not only IS professionals, but with end-users – in language they understand. And the first system to interface with all the leading data base management systems, TP monitors and programming languages.

DATAMANAGER is driven by the world's most versatile data dictionary; one that can be easily tailored to your specific needs. It's a stand-alone system, yet it can be fully integrated with other dictionary-driven products in MSP's MANAGER family – such as DESIGNMANAGER,™ the logical data base design and modeling system, and SOURCEMANAGER,™ the COBOL application development system.

Find out how DATAMANAGER can let you see your data resource under control. Send the coupon today. Or call (617) 863-5800 (Telex 710 326 6431).

msp
MANAGER SOFTWARE PRODUCTS INC
Offices worldwide: Australasia, Benelux, Canada, Italy, Japan, Scandinavia, Spain, Switzerland/Austria, U.K./Eire, U.S.A., West Germany

Send me more information about MANAGER SOFTWARE PRODUCTS' family of integrated, dictionary-driven products:

☐ DATAMANAGER ☐ DESIGNMANAGER
☐ SOURCEMANAGER

Name ____ Title ____
Company ____
Address ____
City/State/ZIP Code ____
Telephone Number (____) ____

Send coupon to MANAGER SOFTWARE PRODUCTS INC., 131 Hartwell Ave., Lexington, MA 02173.
Or call (617) 863-5800, Telex 710 326 6431 DM/CW/6-11

DATAMANAGER is a Registered Trademark of MSP Limited

IN DEPTH/DEVELOPING SYSTEM CODE

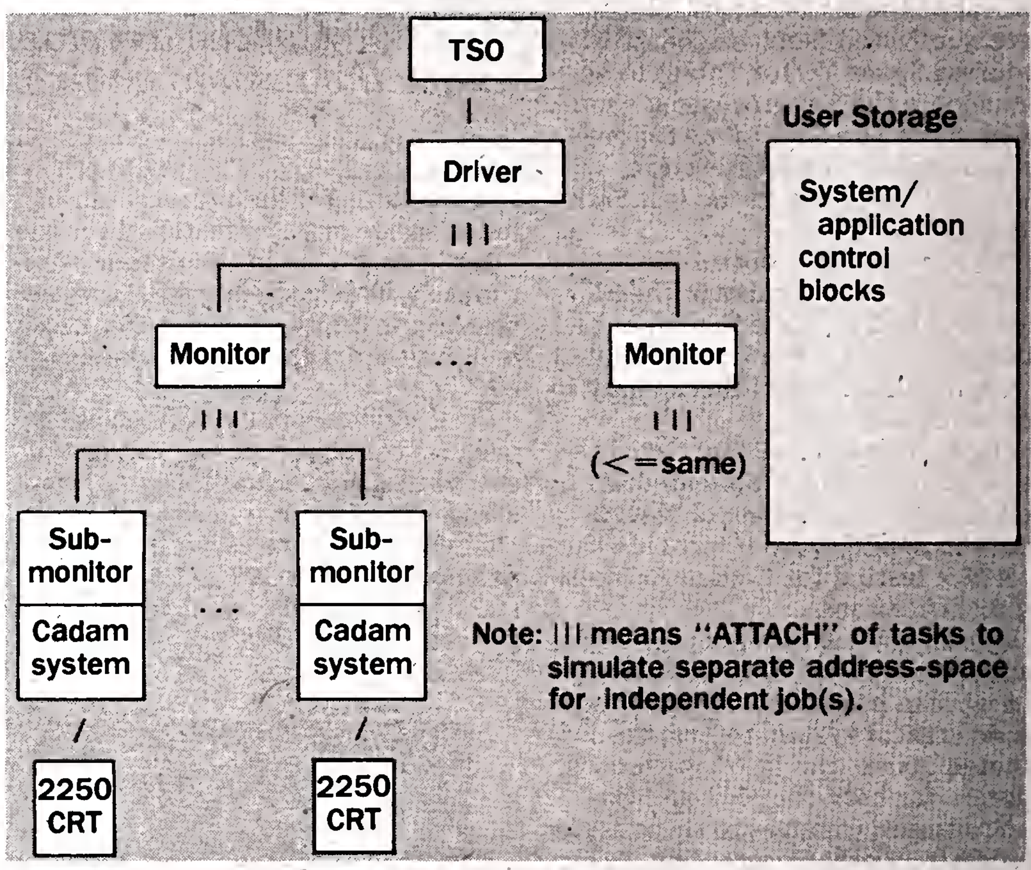

TSO
Driver
III
Monitor
...
Monitor
III
III
(<=same)
Sub-monitor
Cadam system
...
Sub-monitor
Cadam system
2250 CRT
2250 CRT
User Storage
System/application control blocks
Note: III means "ATTACH" of tasks to simulate separate address-space for independent job(s).

Figure 3. Cadam monitor system structure

> *A certain, yet limited, amount of unique code must be installed for the "test" processing in the pseudo environment. This code provided the access to the duplicated control blocks and data areas that have been created.*

The decision about which technique to use or the development of another technique depends upon several factors:

- The storage use implications based upon the amount of "test" code which is added to the system.
- The complexity of the logic to handle the "test" mode processing.
- The overhead incurred by executing the "test" mode checking code even in production processing.
- The desirability to reactivate the "test" mode at some point with only minimal action required.

The SMF Accounting System used the technique of Assembling in/out the "test" code for testing/production versions. This decision was based on the considerations that these modules were in common storage, impacting all users and the desire to reduce processing time for this function, which was referenced numerous times by every job in the system(s).

The Cadam Monitor System, on the other hand, was installed with the "test" code in place. The considerations that this code was in a user address space, the amount of code was small, the processing was infinitesimal in the system and the need to use the debugging code for new configurations of the system hardware were occurring prompted this course.

The use of TSO TEST provided the capability to trace the processing and data values and thus locate errors in the code more efficiently in an on-line environment. Working from storage dumps provided a snapshot of one instant in time with no historical record. The usual technique of inserting trace code into programs can be replaced or augmented by the dynamic establishment of break points and tracing available under this facility.

Also, the actual debugging requirements can be tailored very easily to the specific needs of each case being worked. There is no need to recompile code to modify the tracing or dumping of data to get another picture of the transaction flow or data values in the system being tested. The TSO test facility is very powerful in tracing execution of statements and generating snapshots of selected memory data as processing proceeds.

Additionally, the system can be interrupted and dynamically be patched with this facility to perform immediate corrective action for detected problems.

Stand-alone for 10%

As stated before, not all of the testing can be accomplished in this manner. We were successful in doing about 90% of the testing in this mode but did rely on stand-alone time for the remaining 10%. The requirements to test the code which cannot be exactly simulated, such as the Cross-Memory POST in Cadam, have to be made in a real live environment. About 95% of the problems were detected in the "test" environment.

Overall, the development time for these two projects was reduced by 40% to 60% because of the increased availability of testing facilities. The requirements for stand-alone test time were reduced by 50% to 75% for the implementation. This represented a significant reduction in development time and was directly reflected in development costs. Additionally, the development was completed more quickly and reflected a cost saving in the valuable resource of system developer's time and meeting schedules with quality products.

About the author

Fred Schuff is a software design consultant in Orlando, Fla.

SOFTWARE & SERVICES

SOFTALK
Paul Gillin
CW Senior Editor

Real programmers use Cobol, right?

Why aren't nonprocedural languages used more heavily by programmers?

That is emerging as one of the nagging questions of the modern DP shop. Users are now delivering numerous testimonials claiming that nonprocedural languages can cut coding times by up to 90% on routine applications. Some shops have essentially standardized on fourth-generation languages for new development.

So why isn't everyone following suit? Unfortunately, a lot of the resistance is psychological. Many programmers still have a hair-shirt attitude toward their work: If they don't use Cobol or assembler, they're not real programmers. Fourth-generation languages, for all their demonstrated advantages, are still perceived as being end-user-oriented. And if a programmer uses an end-user tool, that makes him no better than the end user, right?

Part of the fault also lies with the vendors. For years they have claimed that their languages will allow DP shops to offload a lot of work to nontechnical users. Now these vendors are pulling a mid-course switch. Their new tune is that fourth-generation languages can satisfy virtually all programming needs. Given the steady improvement in software design and hardware price/performance, that's probably true. But old perceptions die hard.

However, an evolution is occurring. Even the most technical programmers can't deny that many of their colleagues are becoming hooked on fourth-generation technologies. Perhaps more importantly, these new users often become the rising stars in the organization. Nothing pleases an anxious end user more than seeing a prototype application on a ter-

See **FOURTH** page 112

Integration to end micro chaos

By John Gallant
CW Staff

JERUSALEM — The microcomputer can be the salvation of the corporate data center if it is tied to fourth-generation integrated software on the mainframe, according to the president of Applied Data Research, Inc., Martin Goetz.

Currently in its infancy, fourth-generation integrated software will, in the future, ease much of the chaos that has accompanied the invasion of the micro, Goetz said. Speaking at the recent Fourth Jerusalem Conference on Information Technology, Goetz said the rapid proliferation of micros has made top managers painfully aware of how inefficiently computing power is used.

"For those thousands of companies that have struggled for the last 25 years to effectively use mainframes, the micro has compounded an already complex situation," Goetz said. "Software packages on the micro do not meet most end-user requirements. . . . In addition, the micro will not reduce the need for programming." But fourth-generation integrated soft-

See **GOETZ** page 112

Change monitor out for MVS shops

LOS ANGELES — Candle Corp. has announced a change monitoring system for IBM MVS environments that is said to allow users to monitor and detect any data set changes, including attributes, contents and residence.

Called Deltamon/MVS, the software continuously monitors important MVS system data, such as system program libraries, MVS procedure libraries, hardware configuration and MVS operational status, a spokesman said. It provides for change verification through change monitoring, improved configuration visibility by displaying historical hardware configuration data and facilities to detect changes that bypass normal change-control procedures. It also allows certain MVS parameters to be rebuilt using historically collected data, the spokesman said. Users can ask for a list of changes by date, type of change, area of change and other factors, in any combination.

See **CANDLE** page 109

SOFTLINE/THOMAS O'FLAHERTY

A blueprint for effective training

Second in a three-part series

Earlier in this space, I discussed some of the potential advantages of building an information systems staff based on trainees rather than hiring experienced staff.

However, these benefits depend on an effective training strategy.

There are four components of a successful training program:

- An effective selection process.
- Work assignments and the work experience itself.
- The process of obtaining knowledge.
- The quality of personal relationships and trainee management.

Preference in recruiting should be given to the firm's existing staff, both in data processing operations and from

See **TRAINEE** page 108

O'Flaherty is a principal consultant in the Saddle Brook, N.J. office of Input, Inc., an international computer consulting and research firm and a regular contributor to Softline.

■ Addesse Corp. has enhanced its Performance Analysis and Capacity Evaluation Subsystem for IBM's VM/SP operating system/**98**

■ A testing control facility has been released for IBM's CICS teleprocessing monitor/**98**

■ Time-sharing has become the DP manager's new friend, a recent survey says/**99**

INSIDE

Systems Software/**100**
Productivity Aids/**101**
Application Packages/**101**
Languages/**104**
Remote Computing Services/**106**

ULTIMATE DATA PROTECTION *for MVS, CMS, and VSE.*

The Kryptonite encryption package is a proprietary product created and designed by Fischer-Innis Systems Corporation.

Kryptonite is a trademark of DC Comics, Inc., © 1984 licensed to Fischer-Innis Systems Corporation.

Data encryption puts the protection right into the data itself. It's the only surefire, tamperproof protection — all the time, in all situations, against any threat.

Many governments and large corporations are already using data encryption for their confidential, critical, and proprietary trade secret information. Now Kryptonite/I makes encryption protection easy and practical enough for everyone.

- **Positive protection even while data is stored off-line, or is being transported or communicated.**
- **Works with all S/370 systems: MVS, CMS, and VSE.**
- **Breakthrough in key management techniques:**
  - **Encryption is finally simple, flexible, uncomplicated, and safe to use.**
  - **Allows simplified data sharing among authorized users.**
  - **Kryptonite/I is easy to manage.**
- **Selection of powerful algorithms, including fastest S/370 implementation of the DES standard.**
- **Incredibly fast — up to 2.7 megabytes/second.**
- **Allows distributed security decisions. Users actually responsible for the data can apply their own additional level of security.**
- **Kryptonite/I permits true protection down to the field level. Specific information can be controlled on a "need-to-know" basis.**

**CALL TODAY FOR MORE INFORMATION,
OR TO SET UP A FREE TRIAL:
800-237-4510**
In Florida, call 813-793-1500

FI FISCHER INNIS SYSTEMS CORPORATION

*4175 MERCHANTILE AVENUE
NAPLES, FLORIDA 33942*

Adesse offers 'Pace' for VM/SP

RIDGEFIELD, Conn. — Adesse Corp. has announced Release 1.1 of its Performance Analysis/Capacity Evaluation Subsystem (Pace) for IBM's VM/SP operating system.

According to a spokesman, Pace is a VM-based benchmarking and testing tool that is designed to reproduce the behavior of part or all of a VM user community. Utilizing a standard VM system, Pace interprets scripts that simulate user actions at logical IBM 3270 devices. Simulated users can log on to CMS or other virtual machines or can dial multiaccess virtual machines to utilize the system. The Pace script provides programmable access to terminals.

Release 1.1 features a new command that permits a logical device session to be echoed on the Pace virtual machine console and a command to allow the screen associated with any terminal device to be displayed. With these commands, periodic examinations can be made of the progress of various terminals involved in a Pace session, the spokesman said.

In addition, control of script tracing has been upgraded to permit global management of trace output generation, allowing tracing commands to be imbedded permanently in scripts and bypassed during production use. Script restart facilities have also been added, along with manual reactivation of terminated scripts.

Pace is available for a monthly charge between $975 and $1,950, or it may be purchased for between $22,500 and $45,000.

Adesse can be contacted through P.O. Box 607, Ridgefield, Conn. 06877.

Package debuts for statistical quality control

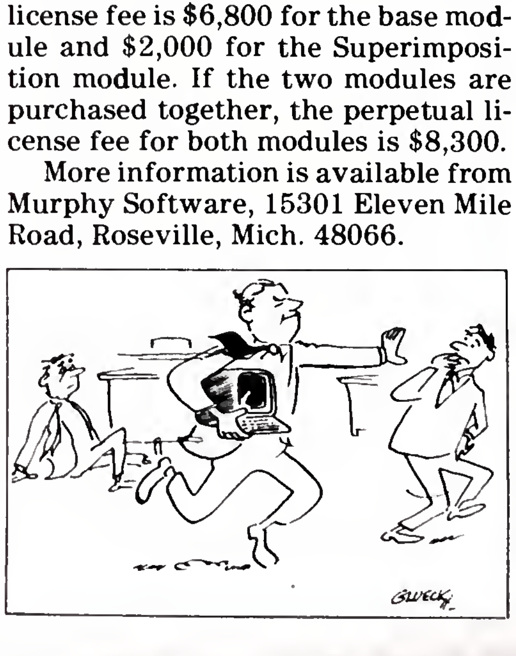
ROSEVILLE, Mich. — Murphy Software Co. has announced a statistical quality control package for users of IBM System/34 and System/36 computers.

According to a spokesman, the SQC/34 system is a stand-alone package that provides a total system for administering statistical quality control. The system displays or prints X bar, R, sigma, high/low, X, moving average, moving range and control charts, as well as histograms, sample statistics, scatter plots and logs of audits.

Archive management programs provided within SQC/34 are said to store and retrieve obsolete quality control data on diskette, and the system includes complete on-line documentation and training exercises. The software provides the ability to superimpose different SQC/34 outputs for comparison. In addition, the system can support multiple users simultaneously, allowing for data sharing.

SQC/34 is available in two modules. The base module provides all capabilities except superimposition, which is provided by the SQC/34 Superimposition module. The perpetual license fee is $6,800 for the base module and $2,000 for the Superimposition module. If the two modules are purchased together, the perpetual license fee for both modules is $8,300.

More information is available from Murphy Software, 15301 Eleven Mile Road, Roseville, Mich. 48066.



Testing control tool out for CICS

DOWNERS GROVE, Ill. — D. A. Brask Systems, Inc. has announced CICS/TCA (Testing Control Aid), which the vendor described as a testing control facility for IBM CICS applications.

CICS/TCA is said to record transactions from one or more terminals, and its I/O screens can be browsed or printed for system documentation. The system has three components: Log, Print and Run. The Log component is said to record on disk all of the screens entered or displayed at one or more terminals. Print allows a user to print, in screen image or dump format, all recorded screens.

Through the Run component, CICS/TCA types and enters the recorded input screens at virtual terminals, and as each screen is received from the application, its content is validated against the recorded output screen. The system operator is notified of any differences. The system can be used to detect CICS initialization errors and to audit activity at remote terminals.

CICS/TCA is designed for use with IBM's MVS and VS1 operating systems, and it supports CICS Versions 1.5 and above. A first-year license costs $6,000.

D. A. Brask Systems is located at 4805 Pershing Road, Downers Grove, Ill. 60515.

Survey: RCS firms seek improved relations with DP

By Edward Warner
CW Staff

STAMFORD, Conn. — The remote computer services (RCS) industry has stopped trying to sell time-sharing and other services behind the back of the data processing manager, according to a recent survey of that industry released recently by Real Decisions Corp.

Instead, RCS vendors want to be "a new friend" of the DP department, according to Len Bergstrom, marketing manager for Real Decisions, which last month released "Time-sharing Decisions," surveying the services offered by 24 RCS firms and the prices they charge for each.

To secure that friendship, RCS vendors are offering a panoply of services directed toward the needs of data processing departments, especially those in use as information centers, the survey found.

Among the services are access to extensive financial data bases that can be downloaded to users' computers; connection from microcomputers to powerful spreadsheets running on RCS mainframes; the sale of software and, in at least one case, microcomputers.

But the big change for the DP manager, Bergstrom said, is that "the traditional enemy [is] now moving toward a partnership." The RCS vendors, he said, are knocking on the DP department's doors and not on those of other corporate departments where application needs exist.

The switch came about, he explained, when more and more firms forced their departments to cost-justify outside purchases of computing resources. That increased DP departments' applications development burden, an area at which RCS vendors are now directing their services.

Bergstrom cited as evidence for his claim the sharp rise in the number of RCS vendors offering IBM-compatible services. For example, both Comshare, Inc. and Computer Sciences Corp. have made the move recently, he said. The shift to IBM has been so marked that RCS vendors "aren't even addressing the other [computer] vendors at this time," Bergstrom added.

According to Bergstrom, RCS vendors' applications development services can prove useful to DP departments which, because of the applications backlog, have switched from information-center-style operations to an emphasis on applications production.

One RCS vendor that is targeting its services both to information center and applications development tasks is the two-year-old IBM Information Network. IBM, Bergstrom said, offers information centers time-sharing service on computers under its friendlier VM operating system or applications development services under the transaction-oriented MVS.

The IBM Information Network, he said, "shows how someone is set up to accommodate this whole in-house [directed] thrust." He added that the service is "very price competitive."

Another trend indicated by the RCS survey is the strong emphasis

See **RCS** page 106

RCS vendors extend offerings

STAMFORD, Conn. — Fresh from a struggle with the forces of low-cost hardware, firms in the remote computer services (RCS) industry have undergone a transformation and emerged as "supervendors," able to meet a variety of users needs in a single bound.

That is the conclusion of a recently released survey conducted by Real Decisions Corp. that looked at the services and prices of 42 time-sharing services from 24 RCS vendors.

RCS supervendors offer everything from access to on-line data bases to access to powerful mainframe software. Such vendors include McDonnell Douglas Automation Co., which offers five services listed by the report, and Control Data Corp., which the report said has six different services. Both firms bolstered their array of services via recent acquisitions.

In all, the report noted that nine of the survey's 24 RCS vendors offer multiple services, four of them with three services each.

According to Len Bergstrom, Real Decision's marketing manager, the trend toward supervendors will continue. RCS firms, he explained, were forced to become supervendors when the spread of low-cost hardware cut into the demand for time-sharing services and the RCS industry began looking to serve data processing departments.

The report also noted the move of the supervendors toward using their own networks. Three-quarters of the RCS vendors surveyed, it said, now maintain their own networks, some backed up by the networks of other firms like Tymshare, Inc.'s Tymnet and GTE Telenet Communications Corp.'s Telenet.

More power to you.

Remember the magic you expected when you first purchased a PC?

It's here.

dBASE III™ is the most powerful database management system ever created for 16-bit microcomputers. It pulls every ounce of energy out of your PC and puts it to work.

On top of that, it's fast and it's easy.

You've never seen anything like it.

dBASE III can handle over a billion records per file, limited only by your computer system. You can have up to ten files open, for sophisticated applications programs.

When you have two related files, information in one can be accessed based upon data in the other.

dBASE III now handles procedures, parameter passing and automatic variables. You can include up to 32 procedures in a single file. With lightning speed. Because once a file is opened, it stays open. And procedures are accessed directly.

Easier than ever.

dBASE III uses powerful yet simple commands that are the next best thing to speaking English.

If you're unsure of a command, HELP will tell you what to ask for.

If you don't know what command comes next, a command assistant does. All you have to know is what you want it to do.

Our new tutorial/manual will have you entering and viewing data in minutes rather than reading for hours.

And to make matters easier, you get a full screen report setup for simple information access.

Faster than no time at all.

dBASE III isn't just fast. It's ultra-fast. Operating. And sorting. Even faster, is no sorting. Because dBASE III keeps your records in order, so you really don't have to sort anything. Unless you want to. Then watch out!

What about dBASE II®?

It's still the world's best database management system for 8-bit computers. And it's still the industry standard for accounting, educational, scientific, financial, business and personal applications.

Tap into our power.

For the name of your nearest authorized dBASE III dealer, contact Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (800) 437-4329, ext. 333. In Colorado, (303) 799-4900.

ASHTON·TATE™

©Ashton-Tate 1984. All rights reserved. dBASE III and Ashton-Tate are trademarks and dBASE II is a registered trademark of Ashton-Tate.

SYSTEMS SOFTWARE

CORODALE, INC.
System/Scheduler Version 1.01

Corodale, Inc. has announced Version 1.01 of its System/Scheduler job scheduling and documentation system for IBM's DOS/VSE operating system.

According to a spokesman, the package is an on-line, interactive operations management system that controls the scheduling and execution of all jobs in a DOS/VSE installation. Jobs can be submitted automatically according to a predefined calendar, dynamically through an on-line System/Scheduler console or through the DOS/VSE operator console.

The system is also said to include an operations data base.

System/Scheduler runs under IBM's CICS or Altergo Products, Inc.'s Shadow II teleprocessing monitors or in stand-alone mode. It provides on-line calendar definition and update, multiple calendar dependencies, multilevel and multisystem dependency definition, generalized process definition, a reporting system of schedules, calendars and process definitions and automated runbook generation.

A permanent license fee for Version 1.01 of System/Scheduler is priced at $13,500. It is also available for rental from $580/mo to $715/mo or one-year lease for between $525/mo and $640/mo.

Corodale, 133 Federal St., Boston, Mass. 02110.

XENOS COMPUTER SYSTEMS, INC.
JES-Master

Xenos Computer Systems, Inc. has announced the JES-Master package for IBM or IBM-compatible mainframes under IBM's MVS operating system.

According to a spokesman, JES-Master allows a terminal operator to review jobs while the work is in progress. The operator reportedly can determine whether there are any malfunctions, such as programming or control errors, and then stop the job and make required corrections before completing the run.

The system is said to allow an operator to focus on a particular section of data, allowing the detection of program errors without a printout. A perpetual license fee for JES-Master is priced between $250 and $350.

Xenos Computer Systems, 4-351 Steelcase Road W., Markham, Ont. L3R 4H9.

TRANS-MANAGEMENT, INC.
PDQ Facility

Trans-Management, Inc. has announced the Page Dataset Quiesce (PDQ) Facility for IBM's MVS environment.

According to a spokesman, the system provides manipulation capabilities for page and swap data sets, allowing users to delete page and swap data sets interactively. Page/swap data sets that have encountered slot errors during processing can be removed with the PDQ Facility. PDQ Facility also allows systems staff to reconfigure a less-than-optimal paging system dynamically.

The system is also said to eliminate the need to schedule the initial program loads (IPL) associated with those problems. It reportedly enables users to avoid excessive IPL's required by page/swap reconfigurations. The PDQ Facility is priced at $4,200 per CPU, the spokesman said, and multiple-CPU discounts are available.

Trans-Management; Suite 209, 3575 Cahuenga Blvd. W., Los Angeles, Calif. 90068.

ELXSI
Enix

Elxsi has introduced a version of the Unix operating system called Enix for use on its 64-bit System 6400 computer system. Enix is available separately or running in parallel with the Elxsi Message-Based Operating System. The Elxsi System 6400 can be expanded modularly from supermini to supermainframe, the vendor said.

Among Enix's reported performance enhancements is demand-paged virtual memory, which allows each program to address up to 4G bytes of data. It also provides a file system, virtual process forking for running parallel jobs and generalized interprocess communication for increased speed.

Up to 14 separate CPU or I/O processors can reportedly be attached to the System 6400 running Enix.

Enix will be available in July and is priced at $24,000 for one to 32 users, $30,000 for 33 to 64 users and $36,000 for more than 64 users.

Elxsi, 2334 Lundy Place, San Jose, Calif. 95131.

ADESSE CORP.
CMS MPS

Adesse Corp. has announced CMS Multiple Printer Support (MPS) for IBM CMS environments.

According to a spokesman, CMS MPS extends CMS support to an arbitrary number of printers and facilitates the use of IBM VM spooling capabilities to provide an integrated mechanism that can be used by applications and end users for printing requirements. The system operates through CMS Filedef commands and associated IBM OS simulation functions in CMS.

The spokesman said that application programs written in most programming languages can utilize this support automatically. The system allows reports to be created directly

Continued on page 101

INTELLECT.™ NO SOONER SAID THAN DONE.

To use INTELLECT, the natural language query system, all you have to do is ask—in everyday conversational English—and you'll retrieve. Immediately, in either text or full-color graphics.

INTELLECT, the world's only successful *true* natural-language query system, is an ideal tool for your information center. INTELLECT's powerful information retrieval capabilities are so advanced that it understands questions and responds with answers as if you were talking to a knowledgeable colleague. Executives access data themselves—more easily than ever before—without learning *any* technical jargon or "computerese." It's so easy to use, it doesn't even have a training manual!

Whether you use INTELLECT as a retrieval system or as an effective data analysis tool, it transforms raw data in the data base into information and presents it in finished color graphics in a matter of seconds. It's a live dynamic interface that fully integrates your existing database and graphic systems.

Already hard at work in hundreds of organizations, INTELLECT is ideal for marketing, finance, personnel, manufacturing, and banking applications.

INTELLECT is an important technological breakthrough. You can learn more about it by attending one of our nationwide seminars. Or put its amazing power at your fingertips in minutes with one of our demonstration tapes.

Call or send coupon for more details. Look into INTELLECT, and be an eyewitness to the future of computing.

NO SOONER SENT, THAN DONE.
Tell me more about INTELLECT.
Name ________________ Title ________
Company ________________
Address ________________
City ________ State ________ Zip ________
Telephone ________________
Hardware Type ________ Info Center? ________
______ Demo Tape ______ Seminar ______ Sales Presentation
ARTIFICIAL INTELLIGENCE CORPORATION
100 Fifth Avenue, Waltham, MA 02254
C-811

ARTIFICIAL INTELLIGENCE CORPORATION
100 Fifth Avenue, Waltham, MA 02254 617-890-8400

Continued from page 100

in the VM spooling system for immediate processing, rather than being written to disk and printed. A number of CMS commands that use Filedef facilities to create printed output can also use MPS with no change.

The spokesman also said that an optional enhancement to CMS is provided that supports a general facility for a CMS system profile, residing on a CMS system disk. It can contain the command to initialize MPS so that it is issued automatically for all CMS users.

CMS MPS is available for a per-CPU monthly charge of $107, or it can be purchased for $2,375

Adesse, P.O. Box 607, Ridgefield, Conn. 06877.

PRECISION VISUALS, INC.

Device driver

Precision Visuals, Inc. has introduced a device driver that reportedly enables users of its DI-3000 graphics tools package to utilize better the hardware features of Megatek Corp.'s 7250 graphics display terminal.

The driver, when used with the device-independent DI-3000 tools package, reportedly can speed application development time and reduce hardware costs for industrial, scientific and other computer-aided design users of the Megatek terminal. The driver supports most major hardware features of the device, the vendor said.

A license for the device driver is priced at $3,000.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

PRODUCTIVITY AIDS

ON-LINE SOFTWARE INTERNATIONAL, INC.

Executrieve enhancements

On-Line Software International, Inc. has announced enhancements to its Executrieve information management software for IBM System/34 and 36 computers.

Designed for nontechnical business workers, Executrieve can design screens for data entry and update, retrieve and analyze data, create standard and ad hoc reports and build bar graphs and histograms, according to the vendor.

English commands, menus and help screens guide the user.

Executrieve includes four functions: query, report writer, dictionary and data entry.

New features include split-link access to secondary files supported by the report writer, help screens for all report writer and query commands from the input line, and page number and date options for reports generated by the report writer, the vendor said.

Present users of Executrieve will receive the enhanced version at no extra charge, according to the vendor.

The price for new users is $8,500.

On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024

INFODATA SYSTEMS, INC.

Inquire Release 84.1

Infodata Systems, Inc. has announced Release 84.1 of Inquire, a family of software products that includes an application development system, a text management facility and a data base management system for IBM or compatible computers running under IBM's MVS, VS1 or VM/CMS.

Features include Infodata's User Language access to IBM's IMS data base management system. The retrieval and reporting mechanism allows users to access both Inquire and IMS data bases during a single User Language session without writing programs.

The cost for new Inquire users begins at $55,000.

Infodata Systems, 5 Tobey Village Office Park, Pittsford, N.Y. 14534.

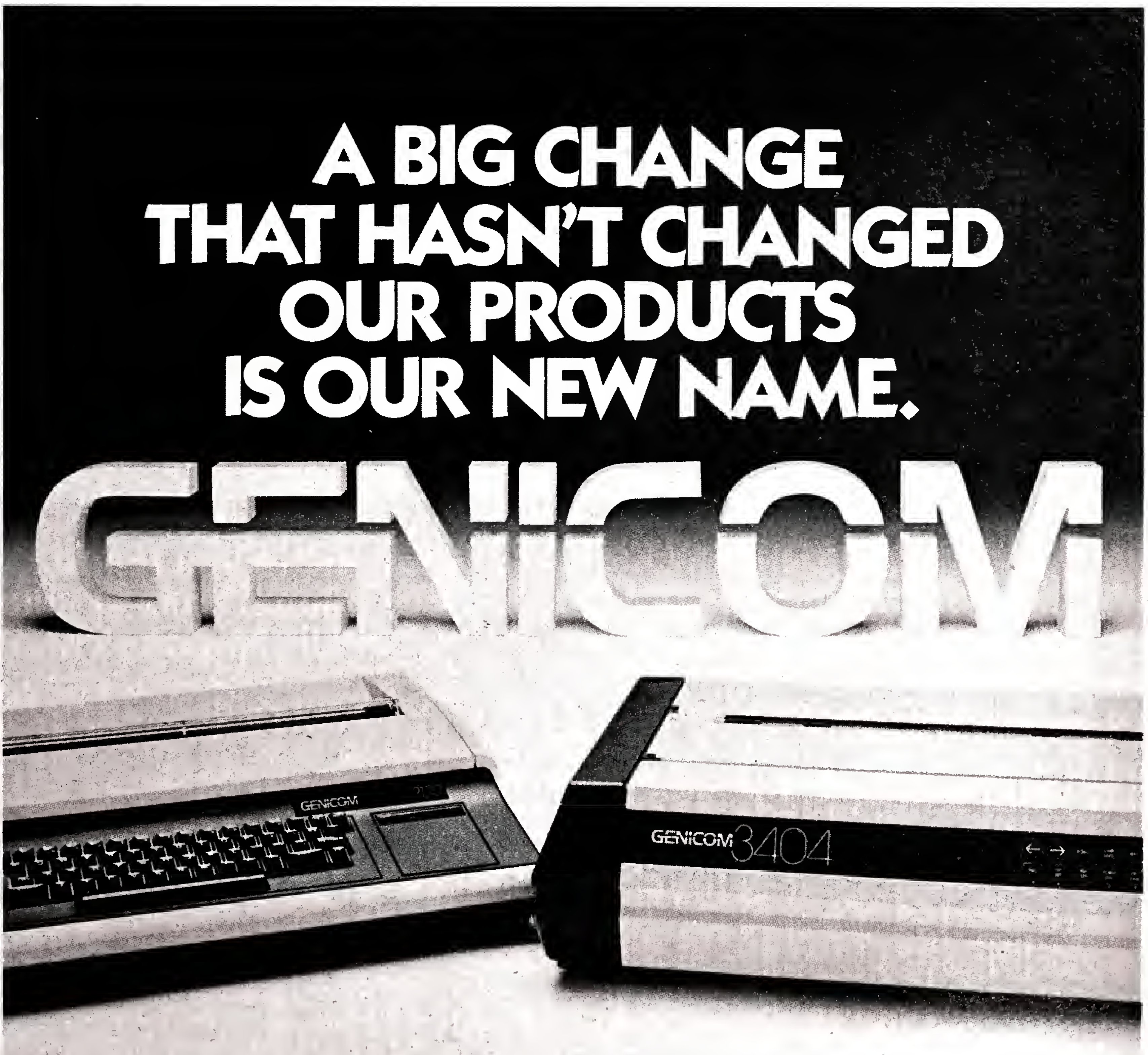
APPLICATION PACKAGES

INVESTMENT ANALYTICAL SERVICES, INC.

Triax

Investment Analytical Services, Inc. has announced the Triax securities processing system for IBM and Burroughs Corp. mainframe sys-

Continued on page 102


A BIG CHANGE THAT HASN'T CHANGED OUR PRODUCTS IS OUR NEW NAME.
GENICOM
GENICOM
GENICOM 3404

Normally, you might not trust a product with a new name. But while all of our products have a new name, they also have a proven history of quality and reliability.

That's because Genicom was formerly the Data Communication Products Department of General Electric. Now an independently owned company, Genicom will continue the same product line we established with GE...only the name has changed.

Our Genicom 3000 family, for instance, still offers the same performance features already preferred by users and the design flexibility so important to OEM's, distributors, retailers and dealers. Speeds from 40 to 400 cps. Single or dual mode printing. Type quality from EDP to NLQ. Multi-color printing. Graphics. Selectable type fonts, American craftsmanship and more.

Of course, we'll also offer Genicom 2000 teleprinters and the soon to be introduced 4000 shuttle matrix printers. You'll find we have the same complete product line that we had with GE. We have the same corps of experienced employees, the same facilities, and the same nationwide service network.

But above all, we have a new commitment to excellence. Which means, while we continue to serve existing customers with established products like our 3000 family, we plan to introduce more products to meet growing needs.

At Genicom, we've changed our name and we're planning to change the future with more innovations, and more of the quality you've come to expect from us under any name.

Genicom Corporation, One General Electric Drive, Dept. M321, Waynesboro, VA 22980. In Virginia, call 1-703-949-1170.

™GENICOM

For the solution to your printing needs call

TOLL FREE 1-800-437-7468

Continued from page 101

tems.

According to the vendor, Triax is an interactive system designed to handle time-critical back office operations in financial institutions. It controls transactions, inventories, financing, customer and syndicate accounts, subsidiary company and branch office accounts, trader and bank clearing accounts and general ledger accounts.

Triax reportedly allows a user to enter securities, financing and cash transactions, update accounts and post current market pricing data from multiple sources to produce confirmations, advices, reports and statements that can be distributed to multiple destinations. The system's architecture is said to be designed to meet or exceed all recognized securities processing industry standards and to comply with all regulatory requirements.

Triax is priced at $100,000.

Investment Analytical Services, 15 School St., Boston, Mass. 02108.

TSI INTERNATIONAL
Docu/Master Office Automation option

TSI International has announced the Docu/Master Office Automation option for its Docu/Master on-line information storage and presentation system for IBM's MVS and VSE operating systems.

According to a spokesman, the option offers full screen, interactive editing of information stored in Docu/Master, and it allows users to create and edit information on-line in the Office Automation environment and transmit it to Docu/Master for storage and retrieval.

The Office Automation option's electronic mail facility allows users to distribute information to other terminals or produce hard copy. Letters, memos and other textual information can be sent to an automated file folder and the system provides a Quick Note feature, resource scheduling and task management facilities.

The spokesman said the Docu/Master Office Automation option is compatible with most word processing equipment when linked to the host IBM 370, 30 series or 4300 series and compatible mainframes. The basic Docu/Master system has a perpetual-use fee ranging from $32,200 to $42,400. The Office Automation option has a perpetual license fee ranging from $38,000 to $51,000.

TSI International, 187 Danbury Road, Wilton, Conn. 06897.

GERBER SYSTEMS TECHNOLOGY, INC.
Automotive Applications Package

Gerber Systems Technology, Inc. (GST) has introduced a software package for the automotive subcontracting industry that reportedly interprets the data bases of certain auto manufacturers in a format acceptable to GST's computer-aided design and manufacturing (CAD/CAM) systems. It also allows users to link this data to software application modules designed for automotive parts development.

The Automotive Applications Package reportedly automates the creation and editing of input splines for interactive modeling of mesh, ruled and new GST draft surfaces. It is also said to generate and certify tool-path data for the machining of automotive structures.

The Automotive Applications Package is priced at $8,000. It runs on GST's IDS-80 multitasking system and Autograph CAD/CAM system.

Gerber Systems Technology, 40 Gerber Road E., South Windsor, Conn. 06074.

ARENS APPLIED ELECTROMAGNETICS, INC.
Presentation Graphics enhancements

Arens Applied Electromagnetics, Inc. has announced enhancements to its Presentation Graphics software.

Enhancements have reportedly been made to all three sections of the program: Business Graphics, the Graphics Toolbox and support programs.

One enhancement is the capability for the programs to run on Unix-based systems and the Fortran 77 language, a spokesman said. The programs formerly were available only for Hewlett-Packard Co.'s HP 3000 minicomputers, according to the vendor.

Business Graphics has been enhanced to include additional capabilities for pie, bar, line and word charts. Log and semilog scales have been added.

Graphics Toolbox is now compatible with Hewlett-Packard's DSG/3000, HPdraw and HPeasychart programs through figure files on the HP 3000.

Presentation Graphics costs $7,500.

Arens Applied Electromagnetics, 435-A E. Diamond Ave., Gaithersburg, Md. 20877.

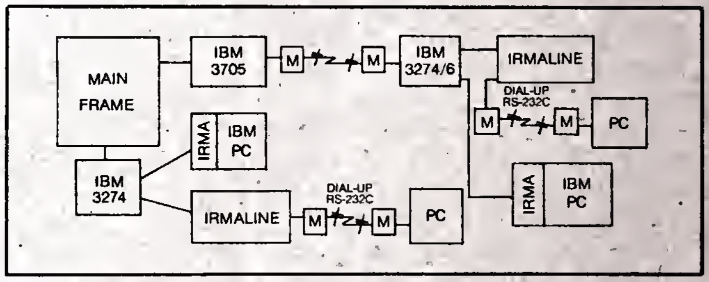
GEOGRAPHIC SYSTEMS INC.
Geomap 3.0

Geographic Systems, Inc. has announced an enhanced version of its Geomap software package, which is used to develop marketing strategies based on demographic information.

The software runs on IBM's 4300, 360, 370 and 3080 series, and Digital Equipment Corp.'s VAX-11/730, 750 and 780 series.

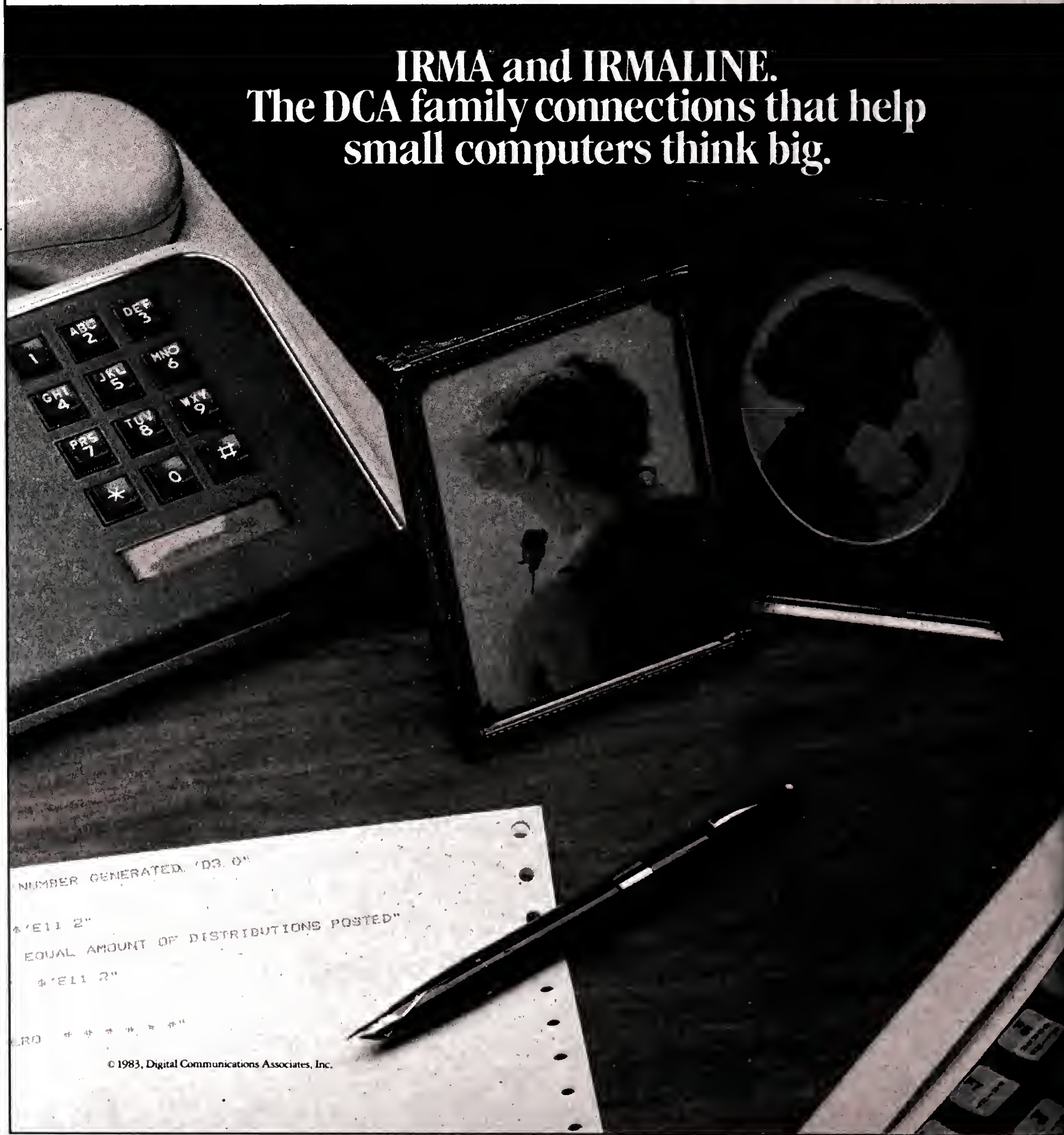
Geomap 3.0 contains new methods of making analyses and new statistical summaries of the data selected, according to the vendor. A data analysis option called Boolean Composite allows users to specify the ranges of data values to be combined for analysis. Also, the number of map overlays supported per Geomap session has been increased from one to 10. A sta-

Here are two beautiful ways to get small computers on line with the mainframe quickly, easily and economically—yours from DCA, home of the industry's first coaxial cable links between small computers and IBM 3270 networks.



IRMA™ is the Decision Support Interface™ that gets IBM Personal Computers and IBM PC XTs into the 3270 mainstream via direct attachment to 3274 or 3276 controllers.

IRMA, IRMALINE, and Decision Support Interface are trademarks of Digital Communications Associates, Inc.


IRMA and IRMALINE.
The DCA family connections that help small computers think big.

© 1983, Digital Communications Associates, Inc.

tistical summary of data is now available.

The product is available now for a permanent license fee of $40,000.

Geographic Systems, 204 Andover St., Andover, Mass. 01810

SOUTHWIND SOFTWARE, INC.

Integrated Productivity Tools

Southwind Software, Inc. has introduced a package of spreadsheet and graphics software called the Integrated Productivity Tools (IPT) for Unix-based systems. The package reportedly provides a direct interface between several data base management systems (DBMS), allowing data to move from its spreadsheet to the DBMS and back, and graphics to be composed from either DBMS or spreadsheet files.

The spreadsheet, Tactician, ties to the folowing DBMS: Unify Corp.'s Unify, Relational Database Systems, Inc.'s Informic and Relational Technology, Inc.'s Micro Ingres.

The graphics application, Grafsman, is built on the Precision Visuals, Inc.'s DI-3000 tool set and is device independent.

Tactician and Grafsman are available separately and in the IPT package. Tactician is priced at $900 for one to 16 users, $1,800 for 17 to 32 users and $3,600 for 33 to 64 users. Grafsman is priced at $2,700 for one to 16 users, $5,400 for 17 to 32 users and $10,800 for 33 to 64 users. The IPT package is priced at $3,600 for one to 16 users, $7,200 for 17 to 32 users and $14,400 for 33 to 64 users.

Southwind Software, 4520 E. 47th St. S., Wichita, Kan. 67210.

DISTRIBUTION MANAGEMENT SYSTEMS, INC.

DMS-2500

Distribution Management Systems, Inc. has announced a program that reportedly combines distribution and warehouse management functions for use on Digital Equipment Corp.'s VAX-11 superminicomputers.

DMS-2500 combines the capabilities of two of the vendor's existing packages, the DMS-1000 Distribution Management System and the DMS-1500 Warehouse Management System, the vendor said. It reportedly features such distribution management functions as order entry and processing and inventory control and such warehouse applications as receiving and putaway controls, random stock location, picking and shipping document generation and transportation scheduling.

The program is written in Cobol and can be utilized either in a centralized, single location or in a multilocation, distributed processing mode. The package is priced at $195,000.

Distribution Management Systems, 81 Hartwell Ave., Lexington, Mass. 02173.

AMERICAN SOFTWARE, INC.

Continuing Property Records System

American Software, Inc. has announced the Continuing Property Records System, which is designed for the accounting and reporting needs of the public utility industry.

Features of the system include on-line data entry, edit and inquiry; depreciable group accounting; depreciable rates tables; utility tax tables; allowances for leased, fundable and insurable property; allowance for environmental protection property; and automated interfaces with construction, general accounting and accounts payable systems.

The price for the Continuing Property Records System is between $80,000 and $100,000. The software operates on IBM 4300 and 30 series hardware, under IBM's OS and DOS operating systems. The software will be available in the fourth quarter.

American Software, 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

MEDIFLEX SYSTEMS CORP.

Clinipac

Mediflex Systems Corp. has introduced an IBM mainframe-based patient care package for the health care industry.

Clinipac is said to be an on-line order entry, medical information communications package that also provides for on-line results reporting from radiology and laboratories.

When combined with the vendor's Medipac program, a general administrative and patient management package, Clinpac provides integrated patient care and administrative applications for single or multiple IBM 4300 and larger series systems, according to the vendor.

The package is priced at $300,000. Pharmacy, radiology and laboratory modules cost $50,000 each.

Mediflex Systems, 990 Grove St., Evanston, Ill. 60201.

COMPUTER SOLUTIONS, INC.

Growthpower Release 3.1

Computer Solutions, Inc. has announced Growthpower Release 3.1, a version of its Growthpower package for manufacturing control applications operating on Hewlett-Packard Co.'s HP 3000 series minis.

The enhancements reportedly include additional features to the accounts receivable, accounts payable, general ledger, sales order processing and purchasing and manufacturing modules. Other enhancements include customer-defined, customized reports; additional data storage and manipulation capabilities; and monitoring and tracking features.

Growthpower, said to be designed specifically for high-technology manufacturing companies, also interfaces with the IBM Personal Comptuer and HP 150 micro. It costs $55,000.

Computer Solutions, One Burlington Woods, Burlington, Mass. 01803.

See **TOOLS** page 104

IRMALINE™ does the same for remote IBM PCs, IBM PC XTs, Apple Lisas and DEC Rainbows, among others, with just a local phone call to a nearby 3270 controller.

Both can go to work literally minutes out of the box. Both provide mainframe data access, selection and storage, and data communication back to the mainframe.

Put first things first. Find out more about the DCA first family of 3270 micro/mainframe connections. For information, write DCA, 303 Technology Park, Norcross, Georgia 30092. Phone (404) 448-1400, TLX 261375 DCA ATL. Or call us toll-free (800) 241-IRMA.

dca®
Digital Communications Associates, Inc

IBM PC and IBM PC XT are trademarks of International Business Machines Corporation. Apple and Lisa are trademarks of Apple Computer, Inc. Rainbow is a trademark of Digital Equipment Corporation.

TOOLS

from page 103

SYNTACOM CORP.
Sytext

Syntacom Corp. has announced a multiuser word processing package for users of IBM's Personal Computer and Digital Equipment Corp.'s VAX-11, PDP-11 and LSI-11.

The Sytext package is said to be a full screen system written in C. A shared runtime program and efficient use of resident memory allow the system to be expanded to any number of users, the vendor said. For DEC users, Sytext is said to interface to standard RMS files, allowing the system to be used alone or as an addition to existing programs.

A spooled printing feature allows a user to continue working during printing. The system's prime editing feature provides the ability to format text in two or more columns and allows wide-formatted text to be viewed entirely on the screen. Multiple right and left indentations can be defined for use in subparagraphing, and the system allows column widths to be changed automatically. Available options include a spelling checker ($375), mailing list feature and a limited textual data base management option ($495).

The Sytext system is designed to run under Microsoft, Inc.'s MS-DOS and DEC's RSTS, RSX-11M, RSX-11M+ and VMS operating systems. Pricing begins at $1,995, which includes the mailing list and spooling features.

Syntacom, Suite G-10, 3303 Harbor Blvd., Costa Mesa, Calif. 92626.

AXIS COMPUTER SYSTEMS L.P.
AX/IOM — MRP

Axis Computer Systems L.P. has introduced the first in a line of software programs for manufacturing business applications.

The first product announced, AX/IOM — MRP, is said to be a full-function manufacturing resource planning (MRP) package. The program operates on the full line of Prime Computer, Inc. superminicomputers.

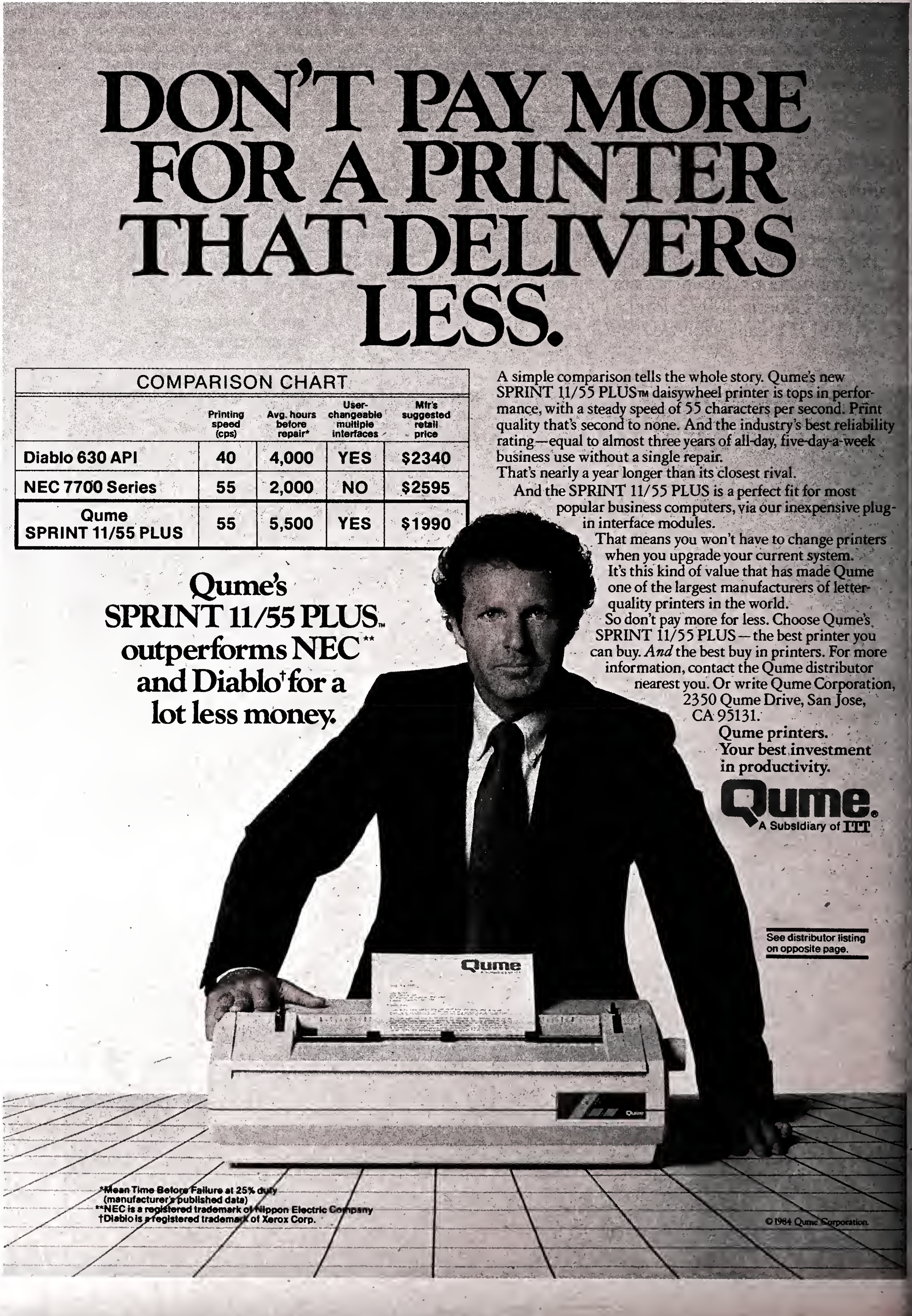
AX/IOM — MRP is an integrated, on-line package consisting of eight

For your best investment in printers.
Call your nearest Qume distributor today.

United States:
American Calculator & Computer
(205) 933-2344—**AL**
Almac Electronics
(206) 643-9092—**WA**
Anacomp (206) 881-1113—**CA, UT, WA**
Anthem Systems (415) 342-9182—**CA**
Bohlig & Associates (612) 922-7011—**MN**
Butler Associates (617) 964-5270—**CT, MA**
Byte Industries
(800) 972-5948 (**CA** Only)
(800) 227-2070 (Outside **CA**)
David Jamison Carlyle
(213) 410-9250—**CA, CO, HI, IL, NJ, TX**
Computers & Peripherals Int.
(315) 476-6664—**NY**
The Datastore (609) 779-0200—**NJ**
Equipment Resources (404) 955-0313—**GA**
Future Information Systems
(212) 732-3905—**NYC**
Gentry Associates
(305) 859-7450—**FL, GA, LA, NC, SC, TN**
Inland Associates (913) 764-7977—**KS**
InterACT Computer Systems
(704) 254-1949—**FL, GA, NC**
Kierulff Electronics
(800) 338-8811—**AZ, CA, CO, CT, FL, GA, MA MD, MN, MO, NC, NJ, OH, OK, TX, UT, WA, WI**
MA/COM-Alanthus Data
(301) 770-1150—**MD**
MicroAmerica Distributing
(800) 431-7660 (**MA** Only)
(800) 343-4411(Outside **MA**)—**CA, MA, TX**
Midwest Microcomputers (419) 782-1115—**OH**
National Computers Syndicate
(312) 459-6400—**IL, MN**
Pacific Mountain States
(800) 272-3222—**CA, WA**
PAR Associates
(308) 371-4140—**CO, UT**
PCA Microsystems (512) 654-4711—**TX**
PCS, Inc. (214) 247-9946—**TX**
Pioneer Electronics
(301) 921-0660—**AL, FL, GA, MD, NC, PA**
Polygon Industries
(504) 834-7658—**LA**
Printer Warehouse (213) 829-5493—(**CA** Only)
(800) 245-9812—(Outside **CA**)
R.C. Data (408) 946-3800—**CA**
Rudor Communcations (212) 245-5509—**NYC**
Schweber
(800) 645-3040—**AL, CA, CT, FL, GA, IA, IL, MA, MD, MI, MN, NJ, NY, OH, OK, PA, TX, WI**
Southern Microcomputer
(305) 621-4237—**FL**
Tek-Aids Industries
(312) 870-7400—**IL, PA, TX**
Terminal Rentals (714) 832-2414—**CA**
Terminals Unlimited
(800) 336-0423—24 Locations
Tricom (516) 483-9700—**NY**
Unico (512) 451-0251—**TX**
Western New York Computer
(716) 381-4120—**NY**

Canada:
Abacus Data Services
(416) 677-9555—**Ontario**
Datamex (416) 781-9135—**Ontario, Quebec**
DataTech Systems
(604) 479-7117—**Alberta, BC, Ontario**
Data Terminal Mart
(416) 677-0184—**Alberta, BC, Nova Scotia, Ontario, Quebec**
Future Electronics
(416) 697-7710—**Alberta, BC, Ontario, Quebec**
Micro Distributing (604) 941-0622—**BC**
Printerm Data (416) 977-1711—**Ontario**

Qume®
A Subsidiary of ITT



DON'T PAY MORE FOR A PRINTER THAT DELIVERS LESS.

COMPARISON CHART

	Printing speed (cps)	Avg. hours before repair*	User-changeable multiple interfaces	Mfr's suggested retail price
Diablo 630 API	40	4,000	YES	$2340
NEC 7700 Series	55	2,000	NO	$2595
Qume SPRINT 11/55 PLUS	55	5,500	YES	$1990

Qume's SPRINT 11/55 PLUS™ outperforms NEC** and Diablo† for a lot less money.

A simple comparison tells the whole story. Qume's new SPRINT 11/55 PLUS™ daisywheel printer is tops in performance, with a steady speed of 55 characters per second. Print quality that's second to none. And the industry's best reliability rating—equal to almost three years of all-day, five-day-a-week business use without a single repair.

That's nearly a year longer than its closest rival.

And the SPRINT 11/55 PLUS is a perfect fit for most popular business computers, via our inexpensive plug-in interface modules.

That means you won't have to change printers when you upgrade your current system.

It's this kind of value that has made Qume one of the largest manufacturers of letter-quality printers in the world.

So don't pay more for less. Choose Qume's SPRINT 11/55 PLUS—the best printer you can buy. *And* the best buy in printers. For more information, contact the Qume distributor nearest you. Or write Qume Corporation, 2350 Qume Drive, San Jose, CA 95131.

Qume printers.
Your best investment in productivity.

Qume®
A Subsidiary of ITT

See distributor listing on opposite page.

*Mean Time Before Failure at 25% duty (manufacturer's published data)
**NEC is a registered trademark of Nippon Electric Company
†Diablo is a registered trademark of Xerox Corp.

©1984 Qume Corporation.

modules, including purchasing and receiving, stockroom inventory control, bill of material, material requirements planning, routings, master scheduling, capacity requirements planning, shop floor control, shop order control and product cost.

AX/IOM — MRP is priced at $70,000.

Axis Computer Systems, 730 Boston Post Road, Sudbury, Mass. 01776.

EEGO SYSTEMS, INC.
Financial Accounting and Reporting System

Eego Systems, Inc. has announced that its Financial Accounting and Reporting System package is now available to users of Perkin-Elmer Corp.'s Series 3200 superminicomputers.

The on-line interactive package includes accounts receivable, accounts payable and general ledger applications. It is designed for accountants and financial managers, the vendor said.

Users can license the package on Perkin-Elmer's Series 3200 processors, including Models 3205, 3210, 3230, 3250XP and 3200MPS. The entire package is priced at $19,500, with individual modules also available.

Perkin-Elmer, 2 Crescent Place, Oceanport, N.J. 07757.

INFORMATICS GENERAL CORP.
The Case Writer

Informatics General Corp. has announced The Case Writer, a mainframe software tool for generating group insurance proposals.

The Case Writer runs on IBM or IBM-compatible mainframes. The software supports group life, basis and major medical, comprehensive, dental and long- and short-term disability coverages, the vendor said.

The Case Writer was developed by Appalachian National Corp., an insurance company in Knoxville, Tenn., and will be available by the end of the second quarter. The price is $75,000.

Informatics General, 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

INDUSTRIAL DATA TERMINALS CORP.
Screenmax

Industrial Data Terminals Corp. (IDT) has introduced Screenmax, an interactive, full screen graphics editing package for the IDT family of industrial, color graphics terminals.

Screenmax reportedly reduces to one hour the time required to create a display and was designed to operate on IDT 2200 or 2250 color graphics terminals. The software uses fill-in-the-blanks operation, eliminating the need for computer programming or an in-depth knowledge of the terminal's individual command sequences, the vendor claimed.

Screenmax is also said to include multiple levels of user aid in the form of prompts, error messages and help pages.

Screenmax costs $1,995.

Industrial Data Terminals, 173 Heatherdown Drive, Westerville, Ohio 43081.

NATIONAL BUSINESS SYSTEMS, INC.
8100 interface to Toss

National Business Systems, Inc. has announced the addition of an IBM 8100 minicomputer interface to its Total Office Support System (Toss) software.

The 8100 interface reportedly allows documents created on an 8100 system under IBM's Distributed Office Support operating system to be transmitted to an IBM mainframe and distributed automatically to the designated recipient. Toss provides electronic mail, calendaring, scheduling, note processing, task management, forms creation and document filing for IBM systems under IBM's MVS, VS1 and DOS/VSE operating systems.

The spokesman said the 8100 interface enables IBM 3270-type terminal users to receive documents created on the 8100 system. Toss pricing begins at $15,000.

National Business Systems, 30 Tower Lane, Avon Park S., Avon, Conn. 06001.

FUSION PRODUCTS INTERNATIONAL
Information Center versions

Fusion Products International has announced that its Information Center software programs and documentation are now available in French, German and Spanish language versions.

Information Center consists of three packages: Fusion/1 Information Retrieval System; Fusion/2 File Management System; and Fusion/3 Electronic Spreadsheet. The software runs on IBM System/34 minicomputers.

Fusion/1 is priced at $4,500; Fusion/2 costs $2,000; Fusion/1 and Fusion/2 purchased together cost $4,500; and Fusion/3 costs $2,500, the vendor said.

Fusion Products International, Suite 295, 900 Larkspur L.C., Larkspur, Calif. 94939.

LANGUAGES

WESTMORELAND SYSTEMS, INC.
RPG-Aid

Westmoreland Systems, Inc., has introduced its RPG Advance Interactive Debugger (AID) for the IBM System/34 and 36.

RPG-Aid reportedly debugs programs by allowing users to break from the program interactively. At these breakpoints, RPG-Aid displays the current statement being executed, the status of all indicators and the contents of fields. Users can then change the breakpoint conditions, field contents, indicator status or the next statement to be executed.

Breakpoints can be set by statement number, status of indicators, contents of fields or any logical combination of the preceding. When set by statement number, they occur whenever a certain statement or label is reached, when a statement number is within a defined range or at each statement.

RPG-Aid is priced at $950 for the System/34 and $1,200 for the System/36.

Westmoreland Systems, Suite 1, P.O. Box 2726, 228 Park Ave. N., Winter Park, Fla. 32790.

UNIVERSITY COMPUTING SERVICES CORP.
ICD74

University Computing Services Corp. (UCSC) has announced the Interactive Cobol Debugger for programs written in Cobol-74 (ICD74) and running on Burroughs Corp.'s large systems.

According to a spokesman, ICD74 is an on-line, interactive facility that allows the Cobol programmer to monitor execution from a terminal. Functions in ICD74 include dynamic setting of breakpoints, the ability to display and change program variables, on-line help, query capabilities for declared program variables, the ability to execute programs one statement at a time and source-file display.

ICD74 reportedly is activated by one statement at the time of program compilation and is identical to the standard Burroughs compiler system. It is priced at $7,500, and a demonstration tape is available for $100.

UCSC, 254 E. Main St., Newark, Del. 19711.

BOSTON SYSTEMS OFFICE
BSO/C

Boston Systems Office (BSO) has announced an optimizing Motorola, Inc. 68000 microprocessor C language compiler.

According to a spokesman, the BSO/C system is an enhanced C compiler that features built-in optimization functions, interrupt and I/O instructions, a runtime mathematical-function library, a flexible operating system interface that permits users to interface to any operating environment, recursive and reentrant code-programming capabilities and symbolic debugging support.

The BSO/C product allows Digital Equipment Corp.'s VAX-11 and PDP-11 processors to be used as microprocessor development systems. The spokesman said the compiler is priced at $5,000 when purchased with its corresponding BSO assembler and debugger packages.

Boston Systems Office, 469 Moody St., Waltham, Mass. 02154.

See **LANG** page 106

David
Recommends Texas Instruments

David Jamison Carlyle Recommends the New Generation of Printers from Texas Instruments.

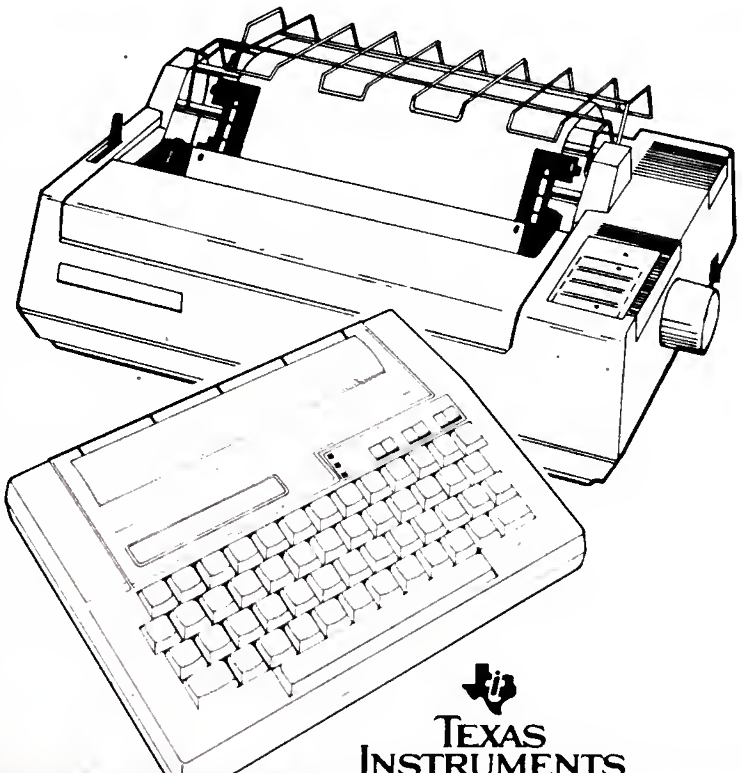
Texas Instruments 850

The 850 micro printer is the first in a family of high performance matrix printers. Featuring speed (150 CPS), quality printing and graphics, plus PC compatibility, the 850 is a price performance leader with the same reliability that has made the Omni 800* series printers the standard in offices around the world.

Texas Instruments 707

The newest edition to the Silent 700 series, TI's 707 *Portable* Data Terminal uses state of the art printing and communications technology to give you all the functions needed to do business in or out of the office.

TI Printers from DJC—The Leader in Peripheral Distribution.



TEXAS INSTRUMENTS

THE DAVID JAMISON
CARLYLE CORPORATION
5700 Buckingham Parkway
Culver City, CA 90230

New Jersey	(201) 780-0802 (800) 526-2823
Illinois	(312) 790-4466
Texas	(713) 541-9611
Colorado	(303) 233-9236
Hawaii	(808) 943-1944
California:	
San Francisco	(415) 254-9550 (800) 227-2610
Los Angeles	(213) 410-9250 (800) 421-3960
Irvine	(714) 851-5011
Florida:	
Orlando	(305) 629-1595 (800) 321-0800

DJC
THE DAVID JAMISON
CARLYLE CORPORATION

LANG from page 105

PLEXUS COMPUTERS, INC.
Native-code compilers

Plexus Computers, Inc. has introduced three high-level, native-code compilers that reportedly increase the performance of its 32-bit P/35 and P/60 supermicrocomputers for Fortran, Pascal and Cobol applications.

The RM/Fortran compiler is said to be the only Fortran certified at the full-implementation level of the Ansi Fortran 77 standard. It costs $2,000.

The Cobol-74 compiler implements the high-intermediate level of the 1974 Ansi standard for the Cobol language, a spokesman said.

It is priced at $4,000.

The Pascal compiler reportedly supports the ISO standard for Pascal. Its features include full access to Unix files and the ability to call C subprograms from within a Pascal program, the spokesman said.

It is priced at $1,500.

Plexus Computers, 2230 Martin Ave., Santa Clara, Calif. 95050.

REMOTE COMPUTING SERVICES

TYMSHARE, INC.
Dial-Up Marsplus

Tymshare, Inc.'s Travel Management Services has announced a dial-up access to its travel reservations service called Marsplus.

Dial-Up Marsplus allows subscribers to gain access to a number of computer reservation systems to check flight availability and fares, make reservations and print tickets, the vendor said.

The service is available to travel agencies in the U.S. and to travel retailers internationally through the vendor's Tymnet packet-switched data network. It can be accessed using the vendor's Scanset terminal or other asynchronous terminals and modem-equipped microcomputers.

The dial-up service costs range from $6 to $12/hour, depending on ticket sales volume at current rate schedules, the vendor said. The cost of the Marsplus service alone starts at $175/mo.

Tymshare, 20705 Valley Green Drive, Cupertino, Calif. 95014.

GENERAL ELECTRIC INFORMATION SERVICES CO.
Quik-Load

General Electric Information Services Co. (Geisco) has announced a program for truck transport firms that is available on the vendor's Mark III teleprocessing network.

Quik-Load reportedly helps truckers use their equipment more efficiently and helps trucking companies deliver their less than fully loaded orders more economically by advertising the availability of a load or truck and providing a list of matching equipment or freight. The program is designed for use by manufacturers who have private truck fleets or for transportation service companies, commodity brokers, wholesalers and distributors, the vendor said.

The cost of the service is $2.50 for placing an advertisement and $6.50 to $7 for receiving a match.

Geisco, 401 N. Washington St., Rockville, Md. 20850.

RCS from page 99

that RCS vendors are now placing on services for personal computers. The survey, the eighth such study produced by Real Decisions, noted that 90% of RCS vendors surveyed this year provide microcomputer services, compared to 63% in its 1983 edition. Some firms, such as General Electric Information Services Co., are even offering IBM Personal Computers bundled as part of a solution package.

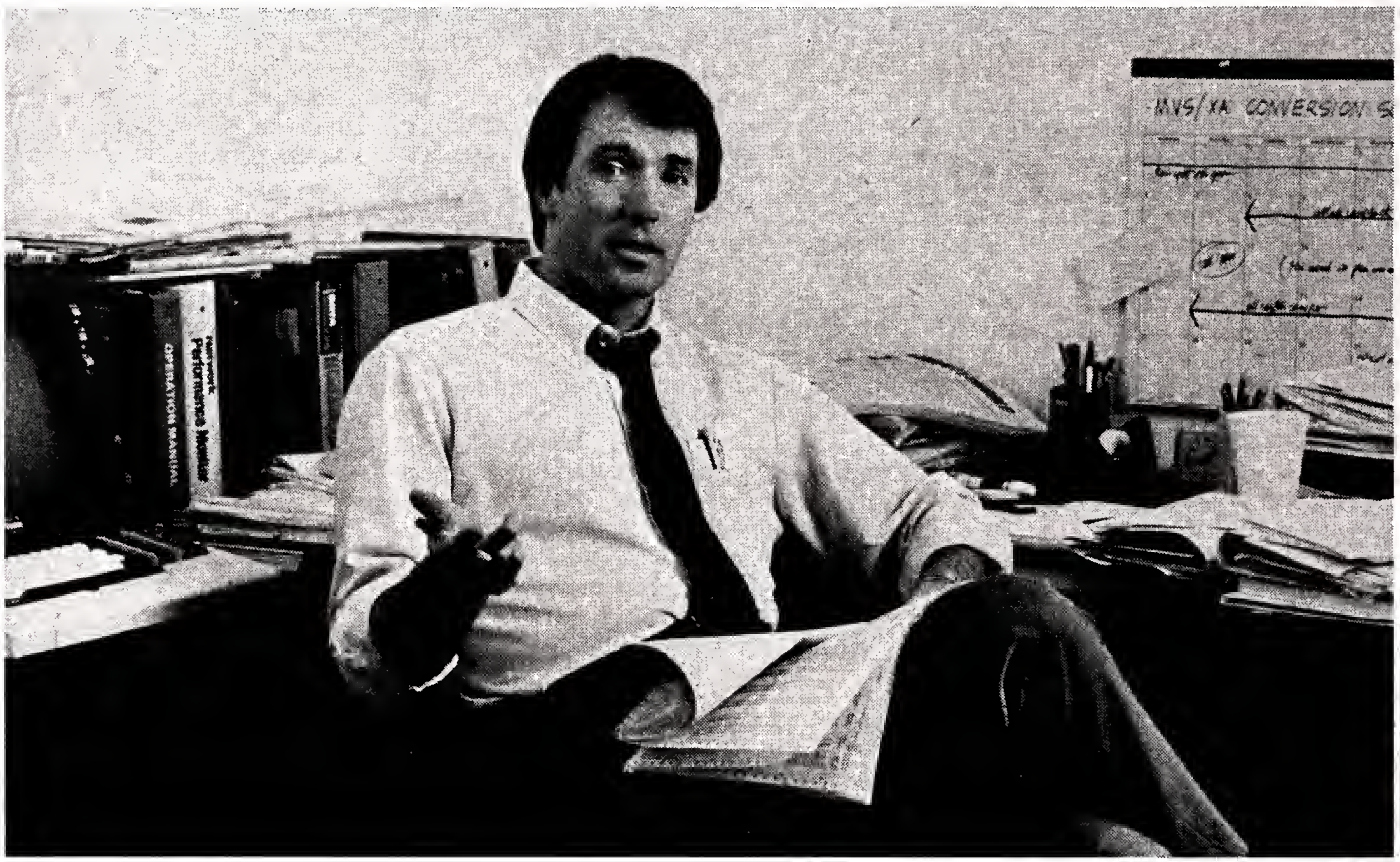
Martin Marietta Data Systems, Inc. recently acquired Mathematica Products Group, Inc., the producers of Ramis II data base management system software, and added Ramis II to its stable of services. Bergstrom said it is likely that other, smaller software houses will be bought by RCS vendors soon.

Bergstrom said the survey found "a lot of aggressive pricing in the [RCS] market" and added that large users should definitely "push for getting some sort of [price] break." According to the report, the cheapest processing, based on benchmarks and prices, was offered by Neshaminy Valley Information Processing, Inc. of Trevose, Pa.

Bergstrom, however, was quick to caution that comparisons among RCS services should not be made simply on the basis of their costs, though the report does provide a means by which DP managers can compare costs.

The report is available for $995 from Real Decisions, located at 123 High Ridge Road, Stamford, Conn. 06905.

What would I do without EasyPROCLIB? That's easy. I wouldn't do without it!*



In the hundreds of installations where EasyPROCLIB has been installed it's proved that you can please all of the people all of the time. And no wonder. Look at what it does for those who use it.

The system programming staff is relieved of the responsibility for maintaining, controlling and repairing the system PROCLIB. That means more time to get other work done.

"We installed EasyPROCLIB when we installed our system. We didn't put it in to solve problems. We put it in to prevent problems."*

Users control their own PROCLIBs; they don't have to go through data center personnel to maintain them. They can create and modify their PROCLIBs at will without affecting any other users. And if a user crashes his PROCLIB, it doesn't hurt the system or other users. And that user is responsible for correcting his mistake.

The installation without EasyPROCLIB has to deal with many problems and decisions.

"Sure it's a system enhancement, and a good one. But we don't think of it that way. It's become an integral part of the system."*

If there's a problem, who fixes it? Who gets the blame for it?

Who decides when a new procedure library is required? Who sets it up?

Can a modification be made on a PROCLIB? What about the probability of JES failures due to frequent changes?

These are just a few of the many problems and decisions that EasyPROCLIB eliminates. There is no limit to the number of procedure libraries that can be established. Each one is the responsibility of the user. And each can be tailored to that user's specific need.

Once it's installed – a very simple process – EasyPROCLIB becomes so much a part of the system that users don't even know it's there. But the data center staff and management know – because it simplifies their job, cutting down housekeeping time and giving them more time to manage. Since it was introduced six years ago, EasyPROCLIB has been installed at hundreds of IBM sites. And wherever it's been installed, it's still in use.

"See how EasyPROCLIB can make your life easier. Try it for thirty days. Free!"**

You can try EasyPROCLIB in your own facility for thirty days on us. Installation takes about an hour of system programmer time and fifteen minutes of machine time.

For more information or to set up your free thirty-day trial, call today. **1-800-368-7638**

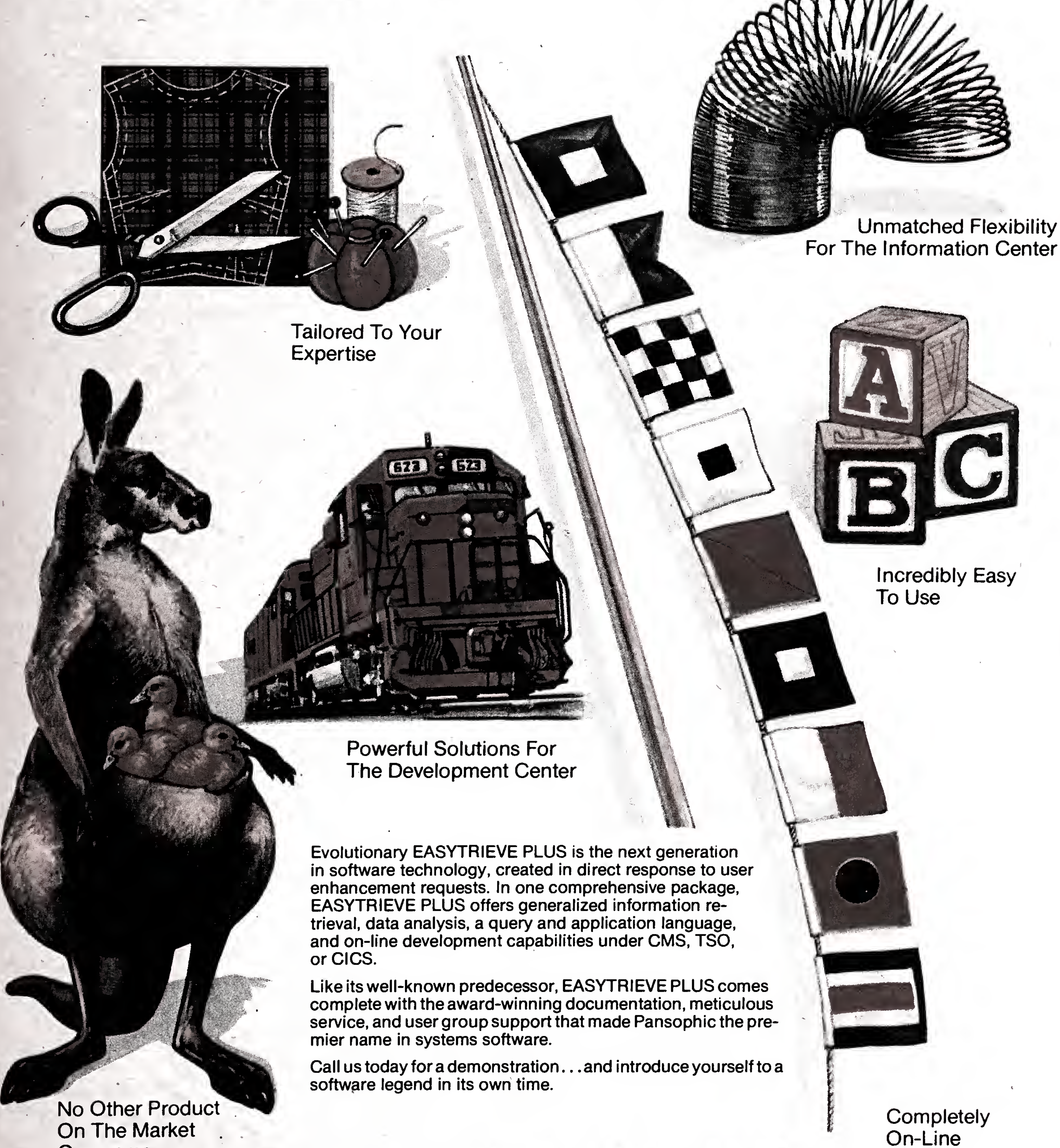
455 Carlisle Drive
Herndon, VA 22070
(703)471-1545

Software Corporation of America

*Comments from interviews with EasyPROCLIB users.
**Comment from Software Corporation of America.
EasyPROCLIB (for IBM, MVS/XA, MVS, SVS, VS1, MVT)

4,500 Users Said They'd Like Us To Put EASYTRIEVE On-Line . . .

We Gave Them All New, Powerful EASYTRIEVE® PLUS



Unmatched Flexibility
For The Information Center

Tailored To Your
Expertise

Incredibly Easy
To Use

Powerful Solutions For
The Development Center

Evolutionary EASYTRIEVE PLUS is the next generation in software technology, created in direct response to user enhancement requests. In one comprehensive package, EASYTRIEVE PLUS offers generalized information retrieval, data analysis, a query and application language, and on-line development capabilities under CMS, TSO, or CICS.

Like its well-known predecessor, EASYTRIEVE PLUS comes complete with the award-winning documentation, meticulous service, and user group support that made Pansophic the premier name in systems software.

Call us today for a demonstration . . . and introduce yourself to a software legend in its own time.

No Other Product
On The Market
Compares

Completely
On-Line

PANSOPHIC®

(800) 323-7335

Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, Illinois 60521. In Illinois, call (312) 986-6000.
In Canada, call (416) 272-0780.

TRAINEE

from page 97

user areas. Transferees from user areas should be encouraged to work on short-term duty in the data processing department before entering the training program.

All trainees should be hired with the idea that each trainee will become a permanent employee of the firm. The trainee program should be structured so that it fosters group cohesiveness.

Some trainees, because of their background and abilities, will be on a "fast track." However, during the training period this should not be reflected in differences in title or salary, but rather in the amount of knowledge and experience gained.

First-year assignments

In their first year, all trainees should receive about the same kind of assignments and education. At the end of the first year, the second year's assignments and training should be worked out between management and the trainee, using a management-by-objectives approach and concentrating on other areas of the operation.

Computer science majors should not be the first choice for general trainee positions. Instead, the hiring pool should be general college graduates and graduates of specialized two-year courses and commercial programming schools. Firms should establish relationships with these schools to obtain their better students.

Trainee selection should be a rigorous process that emphasizes two-way commitment. Standard programming tests have their place; however, structured interviews by different levels of data processing staff are equally important. These can identify motivation that may not come through well on tests.

Work experience is central. It is important that the first assignment be one that generates immediate, positive feedback. An excellent spot for placing many trainees is the operations department in such areas as job control, user liaison and operations improvements. These jobs do not require enormous technical background, but still give the trainee a broad view of DP.

Does this impose a burden on operations? No, because frankly, it is often difficult to find good people who stay very long in these jobs, anyway. The enthusiasm and activity that trainees bring to these jobs are often refreshing. In addition, documentation may become really effective for the first time, since trainees know that they cannot move on until someone else is able to understand their work. In fact, some trainees may get hooked on operations. The organization should be prepared to offer an attractive career path there.

Naturally, most trainees will eventually move into the development area. There is no need for the switch from operations to development to be abrupt. Some programming may take place in operations. Also, some trainees can move gradually into project librarian spots. And every system has many lower priority, small programming projects that are ideal for trainees.

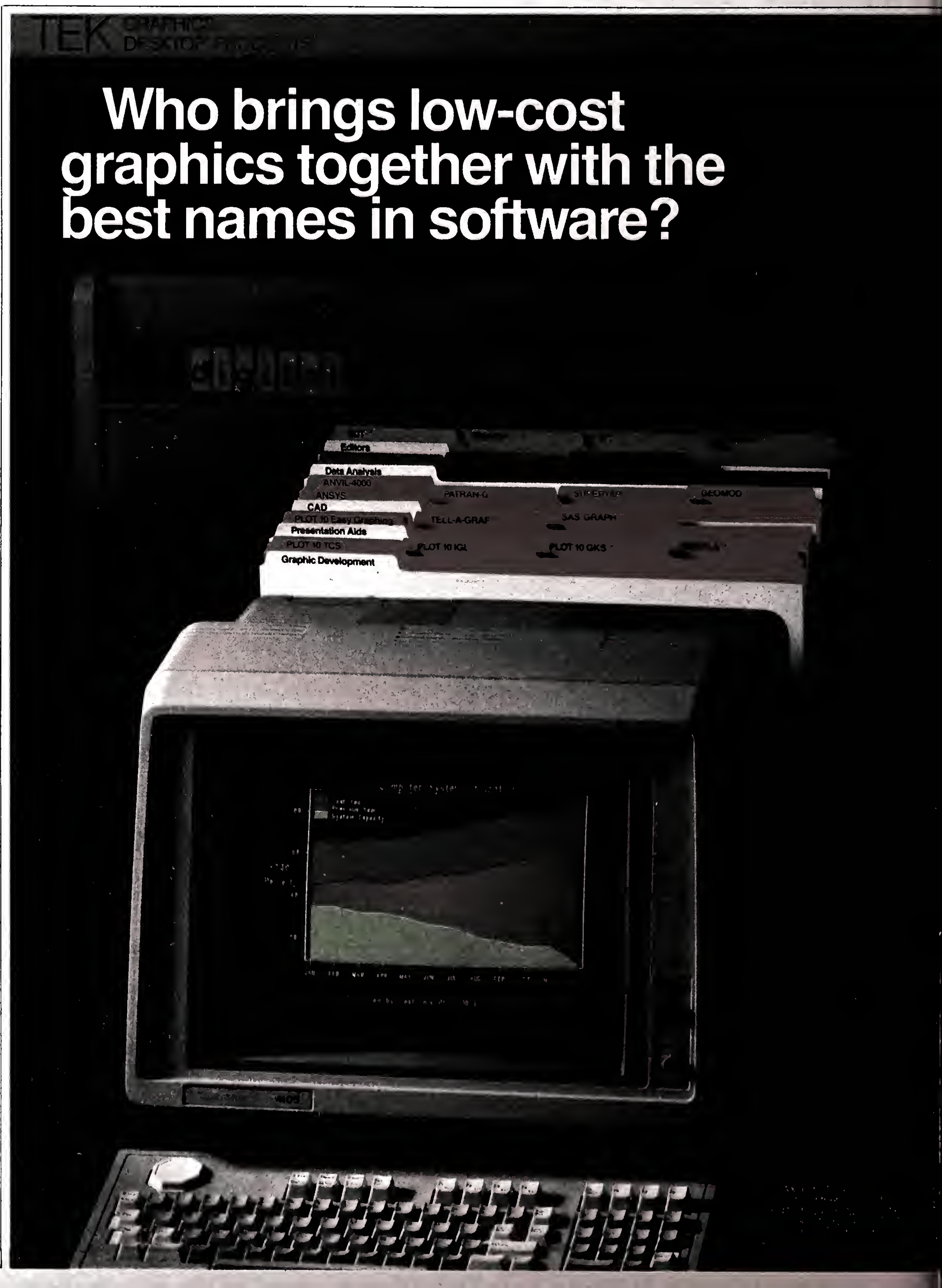
Formal education on a released-time basis should proceed from day one. A day is usually the longest uninterrupted period of classroom training that should be attempted. Several hours a day, every day, is even better. An in-house, videotape education service also offers many advantages by allowing trainees to pace themselves and to catch up on areas in which they are deficient. Also, employees can use video courses to improve further their skills after hours, even in their own

> *An excellent spot for placing many trainees is the operations department in such areas as job control, user liaison and operations improvements. . . . Does this impose a burden on operations? No, because frankly, it is often difficult to find good people who stay very long in these jobs, anyway. The enthusiasm and activity that trainees bring to these jobs are often refreshing.*

USERS OF XEROX COMPUTER SYSTEMS SOFTWARE

We are interested in contacting other DEC-based users of Xerox Computer Systems Software to discuss common problems.

James Cahn
Dixie Mill Supply Company
P.O. Box 52005
New Orleans, LA 70152
(504) 525-6101



homes. Video education can be complemented by live review and discussion and/or on-the-job study.

At first, a trainee's time should be heavily geared toward operations, with about a third allocated to training. As the trainee proceeds through his first year, that load could drop, for example, to 30% for operations, 60% for programming and 10% for education.

Project management and direct supervision of trainees is not simple where trainees have responsibilities in more than one area. Priority conflicts should be resolved by a trainee coordinator.

The trainee coordinator should do more than protect the trainees. He should be responsible for setting up job and education programs with outside institutions, negotiating assignments and, most importantly, being a source of counsel and guidance. He should also set up regular group meetings of all trainees.

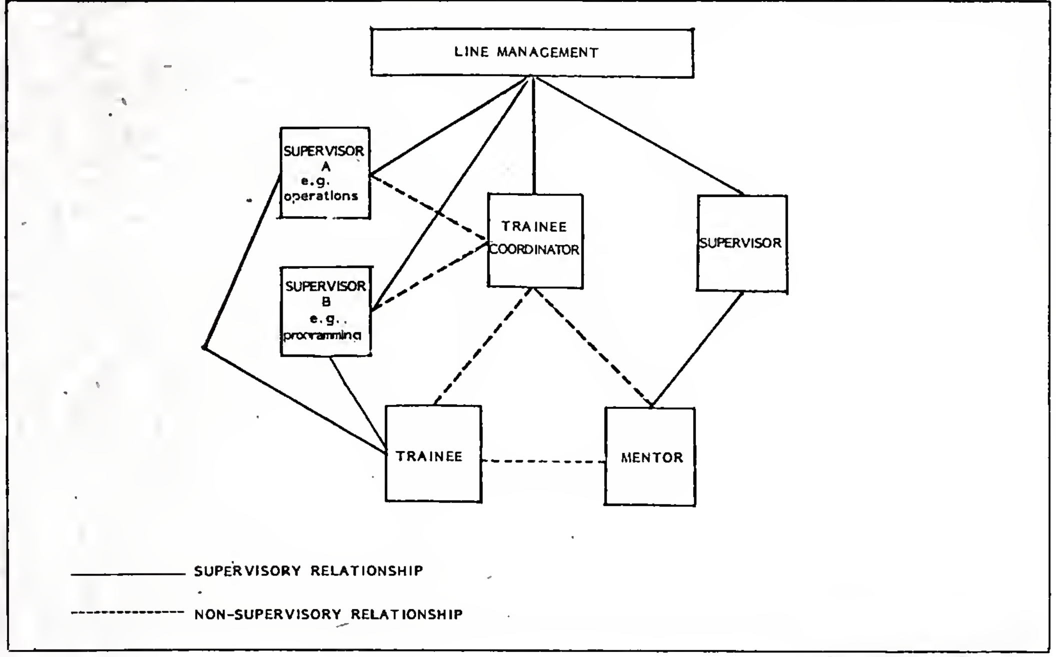

LINE MANAGEMENT
SUPERVISOR A e.g. operations
SUPERVISOR B e.g., programming
TRAINEE COORDINATOR
SUPERVISOR
TRAINEE
MENTOR
SUPERVISORY RELATIONSHIP
NON-SUPERVISORY RELATIONSHIP

Chart courtesy of Input, Inc.

Figure 1. Trainee organizational relationships

However, trainees need other sources of counsel and guidance. Each trainee should be assigned a mentor for his first year. The mentor ideally would be a recent graduate of the trainee program who could provide unofficial advice.

Figure 1 shows the kinds of relationships that would be advisable to sponsor officially. The chart looks complex, but there are reasons:

■ Most data processing personnel relationships are complex.

■ Exposure to only one supervisor can be a high-risk situation for trainees.

■ Unofficial or unsuitable mentors will spring up anyway, but with no clear line to management.

■ The buck will stop at the trainee coordinator.

It is of critical importance that the people filling these roles are chosen with care. Some supervisors, for example, enjoy bringing people along; others do not. Similarly, some supervisors have good work habits, organize tasks effectively and are open to better ways of doing things. These role models can create centers of excellence.

Trainee coordinating should not be a full-time job. The coordinator should be a senior manager not involved on a day-to-day basis with the trainees' work areas. It is important that an effective senior person be in this position, both to show management commitment and to make sure that the training program receives the correct priority.

CANDLE from page 97

Deltamon/MVS requires Candle's Epilog/MVS performance monitoring system and runs under MVS/SP 1.3 and later systems, including MVS/XA 2.1.0, 2.1.1 and 2.1.2, according to the vendor.

Deltamon/MVS will be available in the fourth quarter of this year at a price ranging from $10,000 to $20,000. Epilog/MVS is priced at $19,500.

More information is available from Candle, which is located at Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

THE GRAPHICS STANDARD

Tektronix.

No graphics terminals connect you to better utility or applications software, or with a broader range of computers, than Tek's desktop 4100 Series terminals.

Among the dividends of Tek's long leadership in graphics are the scores of program development tools and powerful applications packages already on-file and immediately compatible with most computers.

From analysis to reporting, cartography to CAD: compatible software helped make Tek's low-cost 4100 Series an immediate success.

Major software vendors like ISSCO, SAS, Precision Visuals and many others offer 4100 users flexibility in data analysis and presentation.

In more technical, engineering and scientific environments, users can take advantage of ANSYS,™ PATRAN-G,™ ANVIL-4000,™ GEO-MOD,™ Tek PLOT 10 Computer-Aided Drafting and Easy Graphing II.

Tek PLOT 10 graphics development software library is installed on more computers than any other in the world. It now includes the new international standard, GKS, and the Core based IGL, plus TCS, the nucleus for scores of specialized packages.

The 4100 Series lets you take full advantage of all these powerful software resources.

Fast, flexible, and priced fully equipped from just $3995, quantity one, the 4100 Series includes VT100 compatibility and ANSI X3.64 text editing right along with its exceptional graphics.

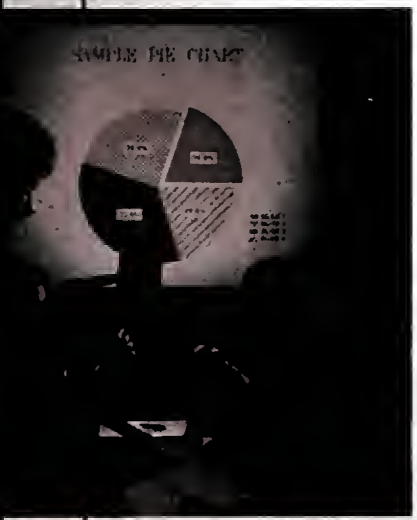
Choose from a range of resolution, segment memory and color capabilities, backed by performance unique to the price range—including a flicker-free 60 Hz non-interlaced display. 38.4K baud communications. And color manipulation by keyboard function keys.

The companion 4695 Color Graphics Copier now makes color copies practical.

It's a very quiet and reliable push-button easy desktop unit that doubles as an alphanumeric printer. Single quantity cost is just $1595.

Your Tek Sales Engineer can help you find the perfect software for your computer, your needs, and our graphics. For literature or the location of your local Tek sales office, call toll-free: 1-800-547-1512. In Oregon, 1-800-452-1877.

Call Tek

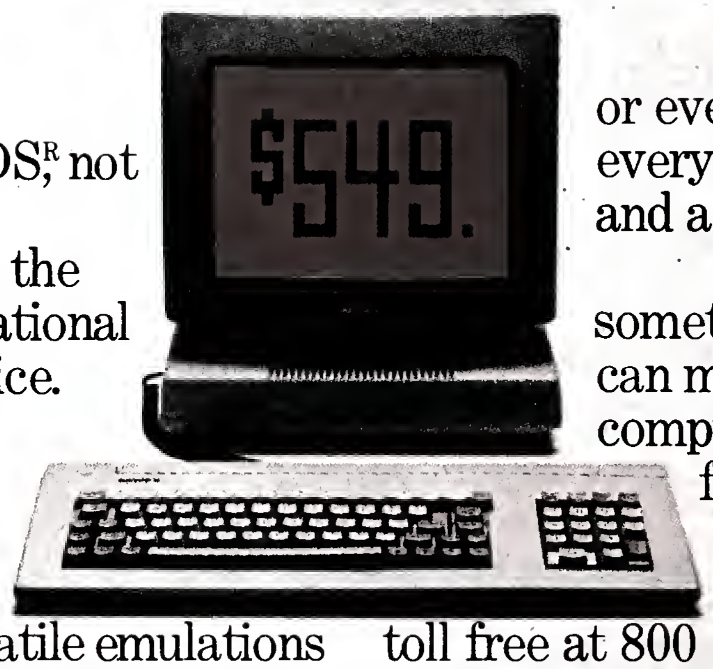


Presentations come alive with the communications impact of full color transparencies that can be produced in minutes.

Powerful graphics team with Tek 4695 color copies and transparencies for a complete desktop analysis and presentation system.

Tektronix
COMMITTED TO EXCELLENCE

ON THE NEXT PAGE WE'VE SHOWN EVERYONE WHO MATCHES AMPEX'S EDITING, EMULATION AND ERGONOMICS FOR ONLY $549.



That's right. No one.

Not TeleVideo,® not ADDS,® not Lear Siegler.®

Not surprising. Because the Ampex 210 isn't just a conversational terminal at a stripped-down price.

It's loaded.

With editing and other features you'd expect only on more expensive terminals.

With 14 popular, non-volatile emulations you can switch at the touch of a key.

And with ergonomics like a low-profile, Selectric-type® keyboard for easy typing. A large 14″ tilt-and-swivel screen for easy reading. And amber or green at no extra cost.

How can we sell all that for $549, or even less in quantity? Then back everything with nationwide service and a full six-month warranty?

By taking advantage of something none of our competitors can match–our 30 years of video, computer peripheral and manufacturing expertise.

So call Ampex Computer Products Division toll free at 800 621-0292. 800 821-9473 in California. Ask us to detail everything we pack into our $549 terminal.

Then go out and compare us to the competition. But don't be surprised if you can't find any.

AMPEX

Ampex Corporation • One of The Signal Companies

TeleVideo, ADDS, Lear Siegler and Selectric are registered trademarks of TeleVideo Systems Inc; Applied Digital Data Systems Inc; Lear Siegler Inc. and IBM.

GOETZ

from page 97

ware, with its power to transfer data, programs and functions between systems, can make the micro the perfect complement to the mainframe, Goetz said. Through that advanced software, users will get the power of the mainframe and the local capabilities of the micro.

Integrated fourth-generation software "exists today in a very crude form," he said. "It will take perhaps seven to 10 years to deliver true fourth-generation integrated software in its final state."

Goetz said fourth-generation systems will be distinguishable from earlier software because they will be engineered with compatible building blocks or "interproduct" components. Examples of these are a common data dictionary, data storage management and screen-generation facilities and communications services. Through these interrelated units, he said, compatibility of function and language will be accomplished automatically.

In addition, fourth-generation software products will incorporate one logical relational data base, a centralized and generalized data dictionary and very high-level application development languages. "Fourth-generation integrated software must be engineered to work with other software products or components so that these components appear to the user as one set of facilities," he said.

Even with fourth-generation integrated software in place on the mainframe, Goetz cautioned, DP management must take certain steps to ensure a successful marriage of micros and mainframes. Central to that success is management recognition of the unique role each machine should play in the DP organization.

"Despite rumors to the contrary," Goetz said, "mainframes will not go the way of the dinosaur. They will continue to be the central point for the control of information. Micros cannot be viewed as independent, autonomous computers within a corporation."

Along with that awareness, management should provide one centrally controlled data dictionary and a data base administrator to control the use of all data on mainframes and micros, Goetz said. Other critical factors in the micro-mainframe linkage are the existence of a single relational data base and the use of high-level programming languages that can be used by professionals and end users alike. "Take a strong hand in determining the role each of these will play in your corporation's success," Goetz said.

That will require a good deal of effort, but Goetz believes a carefully planned micro-mainframe connection can provide a vast array of benefits. They include easier end-user access to corporate information, a reduced mainframe processing load, tighter central control over data and programs, improved programmer productivity and response time and better utilization of the micro's unique strengths, such as its simplified user interface and its windowing capabilities.

FOURTH

from page 97

minal a day or two after he submitted his request, especially if DP had quoted him a six-month turnaround time on the same project. And the user is likely to think the programmer who coded his request has something extra on the ball.

However, fourth-generation languages are not a panacea. That point was driven home late last month in an outstanding presentation by Kevin McGilloway, vice-president of corporate accounting and information systems at Bankers Trust Co. in New York [CW, June 4]. McGilloway spoke at the Focus Users for System Enhancements conference in Orlando, Fla., for users of Information Builders, Inc.'s Focus product.

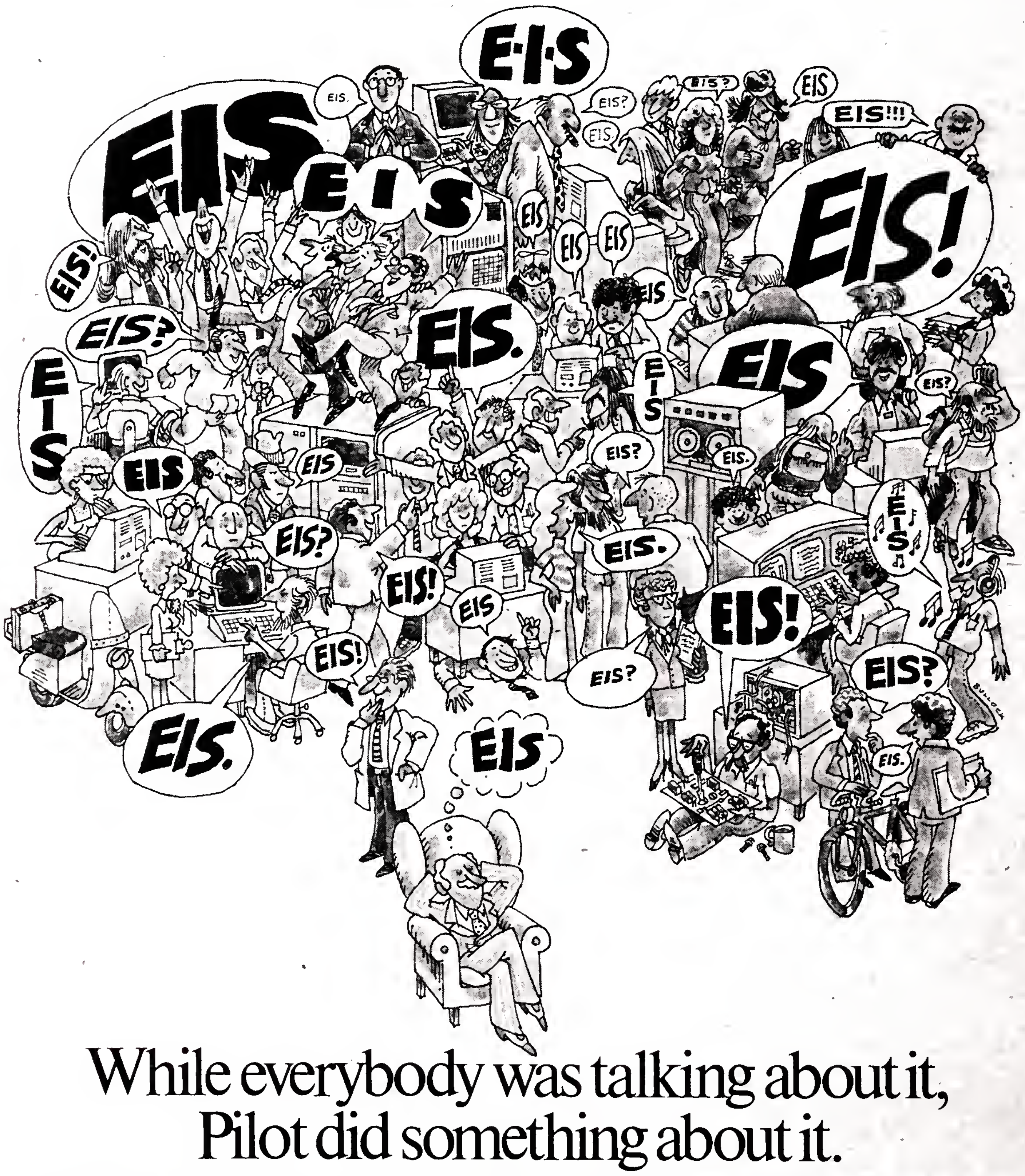
Bankers Trust now uses Focus extensively, but that wasn't always the case. In its early implementation, the company was frustrated by the tendency of what McGilloway called "Focus acrobats" to produce "quick and dirty" prototypes, which were then frequently changed before they were translated into production applications. The resulting systems were often poorly structured and badly documented.

Bankers Trust found that real productivity improvements could be achieved only if the high-level tools were used in concert with a strictly defined and enforced systems development methodology. That includes requiring users to sign off on a set of specifications, documenting heavily at all stages of development and testing prototypes with real production data — all the elements that make up traditional structured development.

Ironically, the use of Focus and other productivity software has not significantly reduced the development life cycle at Bankers Trust. Rather, it has cut by 50% to 75% the manpower required to create an application. And maintenance is easier, McGilloway said.

The Bankers Trust experience highlights what could be the major barrier to general acceptance of fourth-generation technologies in DP. As long as the software continues to be used for second-class applications — those in which turnaround time is more important than quality — the tools won't be taken seriously. But when the software is brought into the mainstream of programming aids and used in a structured fashion, it can become a valuable ally.

The momentum is mounting in favor of more use of these rapidly improving products. It's time for DP to take a closer look at them.



While everybody was talking about it, Pilot did something about it.

Pilot Executive Software announces a new class of software: The first mainframe Executive Information System (EIS). Developed by managers for managers, Pilot's EIS provides "status access" and decision-making facilities never before available.

FOR A DEMONSTRATION OF THE FIRST COMMERCIALLY AVAILABLE EIS, CALL PILOT AT (617) 523-5355.

Information filtering. Compression grids. Synthesis of internal and external information. Plus automated CSF tracking. And the ability to access it all on an IBM PC without touching the keyboard. Call today for a demonstration. Once you've seen everything it can do, you'll understand what all the talk is about.

PILOT
EXECUTIVE
SOFTWARE
183 STATE STREET
BOSTON, MASSACHUSETTS 02109

COMMUNICATIONS

DATA STREAM
John Dix
CW Senior Editor

Fourth-generation PBXs in test mode

The first of the so-called fourth-generation private branch exchanges (PBX) are in, or will soon enter beta-site tests, and production shipments are slated to begin in the third quarter of this year.

CXC Corp. of Irvine, Calif., formally announced its Rose switch recently and reported that it has three systems installed at test sites; and Ztel, Inc. of Wilmington, Mass., said that its first test-site installation will be completed in June.

Both start-up firms have incorporated local-area networks into the architecture of their digital switches, which establishes, in their opinion, their respective PBXs as fourth-generation products.

Each node of CXC's Rose has 192 ports and can support, in its largest configuration, up to 25,000 ports. The nodes are interconnected with a proprietary broadband ring local network that reportedly operates at 50M bit/sec. This network carries voice and data between nodes in a circuit-switched manner at a combined rate of 33M bit/sec, the vendor reported.

The remaining capacity on that ring, roughly 16M bit/sec, is being reserved for future implementation of up to four internal 4M bit/sec token-ring networks. These networks will comply with token-ring protocols of IBM and the IEEE 802 Committee, the company reported.

Until that standard has completely jelled, CXC will use an internal 10M bit/

See **NET** page 120

Baybanks' communications control center

ATMs assure Baybanks growth

By James Connolly
CW Staff

WALTHAM, Mass. — An early commitment to automated teller machines (ATM) has helped a Massachusetts bank maintain a 25% to 30% annual growth in ATM transactions through a network, based here, that recently passed the 530-machine level.

Officials at Baybanks, Inc. noted that almost all their customers have bank cards and that more than 50% use those cards at least once a month. Nationally, an average of only 30% of card-holders have ever used their bank cards.

Baybanks, which has 209 branches throughout Massachusetts and New Hampshire, made its commitment to ATMs seven years ago. Its more than 530 ATMs include Diebold, Inc. Model 550 machines and the newer Diebold Model 910s at 378 sites. The bank also is in the process of installing withdrawal-only terminals at more than 300 retail stores in a joint venture with the Bank of Boston known as Combinet.

"We perceived that in this marketplace, people wanted additional forms of service. They wanted more than we were giving them at the branches — things like longer banking hours. And we put our emphasis on what the customer could do for [himself]," said Donald Isaacs, president of Baybanks Systems, Inc., the bank's data processing subsidiary.

The bank initially installed 10 Diebold 550s in areas such as Cambridge's Harvard Square. The Baybanks network, including about 30 ATMs owned by other banks, has grown to where it ranks among the eight largest networks in the U.S. and is tied into the nationwide Cirrus Systems, Inc.'s Cirrus Network.

The Diebold 550s are being phased out in favor of the Diebold 910s. Isaacs noted that the older models are slowed by their use of a drum-type cash dispenser, but that they feature the ability to execute simple transactions independently of the bank's mainframe, needing only to know that the customer's account is in good standing.

While more dependent upon reliable communications lines, the dumb-terminal Diebold 910s are faster than the Diebold 550s, Isaacs said.

Reliability is a key to Baybanks' ATM success, he stressed. "Everybody in the company, from the chairman of the board down, has set it as a priority."

Isaacs pointed to figures indicating that during April each site was on-line 99% of the time. He also cited a host computer availability of 98.9% for the same month.

The ATMs, distributed as single machines or in clusters of up to nine, as at Harvard Square, are linked by leased

See **ATM** page 120

INSIDE

Controllers/**114**
Voice/Data Communications/**114**
Protocol Converters/**114**
Software/**114**
Multiplexers/Modems/**118**
Local-Area Networks/**118**
Auxiliary Equipment/**118**

Study predicts local net trends, price decline by 1988

SAN JOSE, Calif. — A report published here recently by Strategic, Inc. forecast that broadband local-area networks will account for 85% of the networks shipped in 1988, compared with only 15% in 1983.

Broadband systems' 1983 revenues already exceed those derived from the shipments of baseband systems, the report claims, because of much higher system prices arising primarily from the greater number of connections provided.

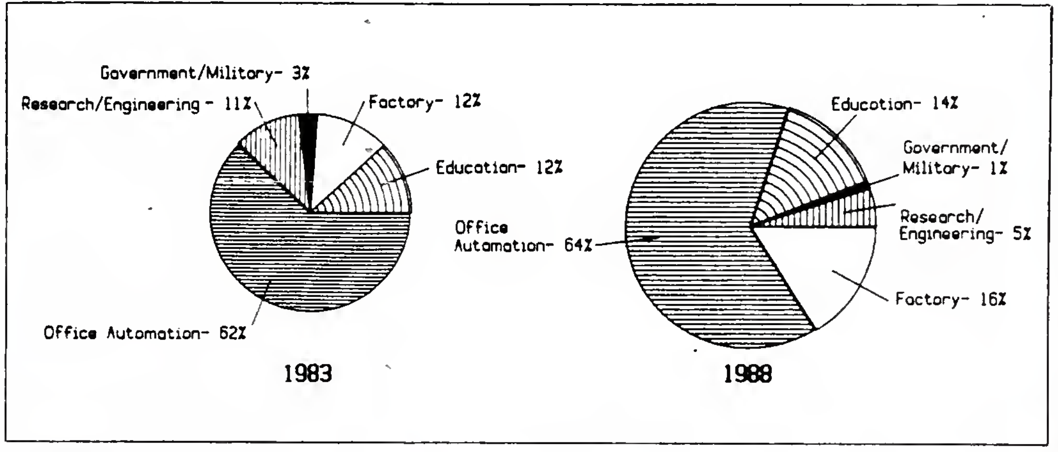
Local nets, the report specifies, are used in three geographical environments: work area, intrabuilding and interbuilding in campus-type sites. The use of dedicated wire in these applications, as used for years, is said to be "cumbersome and somewhat inflexible as geographical dispersion of connected equipment increases." Local nets, on the other hand, offer an attractive alternative with certain inherent advantages, such as ease of device connection and accessability to multiple hosts.

According to the study, there will be a drastic decline in the average unit price per connection for the three primary types of networks — baseband, broadband and fiber optic.

For baseband networks, the projected connectivity pattern is flat, with an average of 13 connections per system across the 1983-1988 time frame. The primary reasons for this pattern are the work-area orientation of baseband network system applications and the limited capability provided (no video, for example), the report said.

Broadband networks will experience a decline in the average number of connections per installed system from 100 in 1983 to 60 in 1986 and after. This pattern results from the gradual shift away from using a broadband local-area network as an all-purpose vehicle and toward greater work-area and intrabuilding backbone approaches with gateways connecting baseband local-area nets to the broadband spine.

The number of connections per fiber-optic network remains relatively flat until 1986 because of the exceptionally high cost of these systems.



Installed base of systems

As fiber net costs are reduced, due in part to Japanese commitment to the technology, the number of connections per system will grow from five in 1985 to 60 in 1986 and accelerate to an average of 120 by 1988.

This growth, the report says, will occur primarily among very large sites that will be rewiring for optical fiber to consolidate their local nets and provide a base for future growth. The high cost of optical fiber is not a significant factor in sites of this size relative to the benefits to be achieved.

Integrated voice/data private branch exchanges (PBX) will provide a viable alternative to local-area networks in many situations. These PBXs, the study argues, are in their infancy, with only a handful of vendors currently offering products. The ability to handle voice and data on a single system is appealing to firms looking to "kill two birds with one

See **STUDY** page 120

COMMUNICATIONS

CONTROLLERS

INNOVATIVE ELECTRONICS, INC.

Netmaster

Innovative Electronics, Inc. has unveiled Netmaster, a microprocessor-based concentrator that provides conversion from IBM's Synchronous Data Link Control to NCR Corp.'s or Burroughs Corp.'s poll/select protocol.

The 16-bit Netmaster computer reportedly functions as a remote in-store processor for credit card authorization applications. Netmaster operates in conjunction with a Systems Network Architecture IBM host equipped with a 3705 or 3725 front-end processor and one or more NCR or Burroughs controllers connected to point-of-sale terminals.

Netmaster reportedly accumulates transactions when the host CICS transaction rate becomes too high and acts as a real-time regulator, maintaining the quality and flow of data to the host computer.

Netmaster includes built-in diagnostics and is priced at $3,200.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

VOICE/DATA COMMUNICATIONS

NORTHERN TELECOM, INC.

Digital Facility Management System

Northern Telecom, Inc. has introduced the Digital Facility Management System (DFMS), which is said to automate fully the maintenance and administration of digital communications facilities.

Targeted at the divested Bell operating companies, DFMS uses a combination of hardware and software to monitor digital T-carrier spans to warn operators of trouble through audio and visual displays, the spokesman said.

The system prioritizes network troubles for test operators and graphically sectionalizes failed T-carrier systems.

DFMS is priced between $50,000 and $2.5 million, depending on the demands of the user's operation, according to the vendor.

Northern Telecom, 3 Speen St., Framingham, Mass. 01701.

PROTOCOL CONVERTERS

MODEMSPLUS, INC.

Brite II

Modemsplus, Inc. has announced Brite II, a protocol converter for conversions from Ascii to Burroughs Corp.'s poll/sellect protocol that, as an external stand-alone unit, is said to provide full screen emulation to any Ascii or Teletype Corp. CRT terminal or personal computer.

According to the vendor, Brite II is menu-driven and supports RS-232 to TDI conversion. The device is scheduled for November delivery and costs $1,295 in single-unit quantities. Quantity discounts reduce the price to as low as $1,075 for 10 or more units, the vendor said.

Modemsplus, 217 E. Trinity Place, Decatur, Ga., 30030.

INNOVATIVE ELECTRONICS, INC.

MC 800

Innovative Electronics, Inc. has announced a protocol converter that is said to allow up to 32 asynchronous Ascii devices to communicate with an IBM or equivalent host computer using either Systems Network Architecture/Synchronous Data Link Control or bisynchronous protocols.

The MC 800 protocol converter is designed to appear to the host computer as an IBM 3274 or IBM 3276 communications controller with IBM 3278 or 3279 terminals attached.

According to the vendor, it is suited for computer facilities with numerous remote sites and only one or two 3270 terminals per site.

The MC 800 is available now in configurations ranging from five to 32 ports. Prices range from $3,600 for the five-port unit to $15,990 for the 32-port configuration, according to the vendor.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

SOFTWARE

DATA GENERAL CORP.

Unite; DG/NTR

Data General Corp. has announced two communications packages designed to allow its MV series of Eclipse superminicomputers operating under AOS/VS to communicate with Sperry Corp. 1100 series mainframes.

Unite is a software package that emulates a Sperry UTS400 controller, slave terminal and 0786-type shared print peripherals and allows AOS/VS users to communicate interactively with Sperry 1100/90 series computers over synchronous communications lines.

DG/NTR is a package that is said to allow AOS/VS users to communicate in batch mode with Sperry 1100 series computers over synchronous lines. It uses the NTR remote batch protocol.

According to a DG spokesman, its Dasher terminals configured for Unite or DG/NTR can be shifted between local Eclipse processing and Sperry processing.

Unite is available at $13,000 for an initial license and $5,000 for a subsequent license. DG/NTR is avail-

Continued on page 118

IBM System
34,
IBM System
36,
IBM System
38,
WHO WILL YOU APPRECIATE?

Dataserv
We're your one-stop shopping center for IBM systems and peripherals.

Before choosing an equipment vendor you'll want to consider…

- *Availability—Can they deliver on time?*
- *Selection—Do they have inventory or access to the **specific** model with the features you need?*
- *Expertise—Are they experienced at putting together the right package?*
- *Financial Flexibility—Can they offer multiple buy/sell/lease options with flexible terms at competitive rates?*
- *After Sale Support—Will they be there when you need them?*

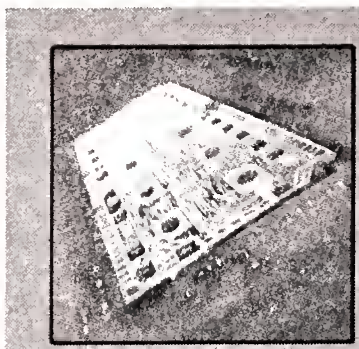
Dataserv has been in business for 15 years and we've participated in thousands of transactions totalling almost 1 billion dollars.

We're a leading source for S/34, S/36, S/38, Series 1, and DPD Systems. Before making your next computer decision, ask us for a QUIKQUOTE.™

Call TOLL-FREE 800-328-6729.

dataserv
***When** you know **why** and **what** to buy.*
*Let us show you **how.***

Isn't it about time for the next milestone in office information systems?



1970
Four-Phase announces the industry's first all-LSI Central Processing Unit to give you increased performance in a smaller computer system.

1973
Four-Phase wins the largest-ever contract with the Federal Government for a data entry system.

Motorola/Four-Phase introduces The 6000 Series–a new milestone.

A milestone for new standards in office information systems from the company that started it all.

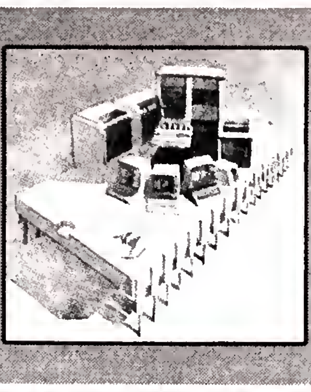
From the moment Four-Phase introduced the world's first all-LSI computer in 1970, we have consistently presented the industry with innovative hardware and software products to help make business more profitable and productive.

Today, as a member of the Motorola Information Systems Group, Four-Phase once again unveils another milestone in information processing—the new 6000 family of office information systems. Compact, powerful processing units and flexible, capable software have been fused together into a family of systems that deliver maximum results today, with substantial expansion capabilities for tomorrow.

Technology for the real world.

Motorola/Four-Phase systems are tough enough and smart enough to deal with the real world—where speed, power, and reliability in a multi-user environment are prime considerations. The new 6000 systems feature the high-performance 32-bit Motorola 68010 CPU and an operating system derived from UNIX* System V under license from AT&T. We created

1978
Four-Phase announces The MULTIFUNCTION EXECUTIVE* (MFE), the first DDP operating system to allow multiple applications to run concurrently and independently.



1982
Four-Phase is acquired by Motorola Inc., combining our information processing expertise with one of the world's leading manufacturers of semiconductors and electronic equipment.

integrated system software that combines these two industry standards into a powerful, multi-user, multitasking environment that can stand up to practically any application.

There are two systems in the 6000 family. The 6300 supports 1-8 users, making it perfect for the smaller user or a remote office. The 6600 is a high-performance system designed to support up to 128 users. Both systems offer complete and integrated solutions—whether they're working in an operations-oriented environment where efficiency and precision are needed, or a results-oriented environment where flexibility and quality are key.

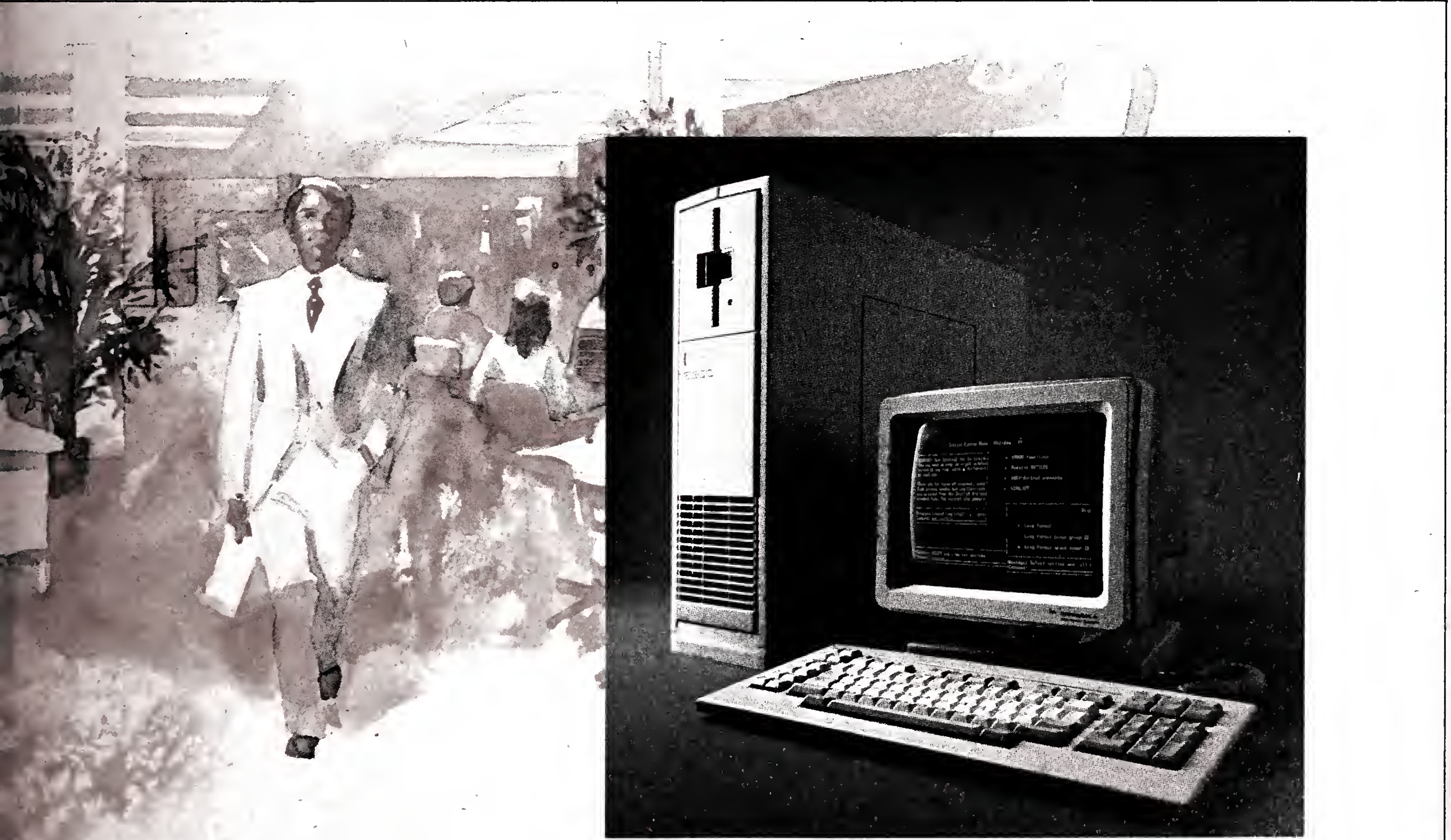
Service and support to match our technology.

At Motorola/Four-Phase, our commitment to you goes beyond providing quality, high-performance hardware and software. Support is just as important. Our award-winning Customer Support Operation is staffed with over 1,150 customer support specialists in over 175 cities across the nation. One phone call to our Operations Center will ensure prompt response from the nearest available specialist. And you can call the Center 24 hours a day, 365 days a year.

If you're a DP/MIS manager or OEM, find out what the latest milestone in office systems can mean to you. Contact Motorola/Four-Phase today at 1-800-528-6050, ext. 1599. In Arizona, call 1-800-352-0458, ext. 1599. Or write us at 10700 North De Anza Blvd., M/S 52-3B1, Dept. S., Cupertino, CA 95014.

MOTOROLA
Four-Phase Systems

Motorola and Ⓜ are registered trademarks of Motorola Inc.
Four-Phase is a registered trademark of Four-Phase Systems, Inc.
*UNIX is a trademark of AT&T Bell Telephone Laboratories, Inc.



A milestone in productivity—The 6000 Series from Motorola/Four-Phase delivers information processing performance today, and expansion capabilities for tomorrow.

COMMUNICATIONS

Continued from page 114

able at $6,000 for an initial license and $3,000 for a subsequent license, the vendor said.

DG, 4400 Computer Drive, Westboro, Mass. 01580.

NETWORK SYSTEMS CORP.

Remote Design System

Network Systems Corp. recently announced the Remote Device System, software designed to extend the distance between IBM host computers running MVS or VM and channel-attached peripherals.

Remote Device System reportedly allows placement of high-performance devices, such as IBM 4250 printers and IBM 3290 plasma displays, any distance from the IBM host computer.

The software resides on the host and is said to provide high-speed transfer of data through Network Systems' Hyperchannel networks by means of microwave, T1 telephone-compatible lines, fiber-optic cable and coaxial cable, a vendor spokesman said.

It is available for a $400/mo license fee, the vendor said.

Network Systems, 7600 Boone Ave., Minneapolis, Minn. 55428.

MULTIPLEXERS/ MODEMS

DIGITAL PATHWAYS, INC.

Data-Flo 212A

Digital Pathways, Inc. has announced an identifiable modem for mobile users of secured computer systems.

Data-Flo 212A is said to allow salesmen and others who travel to have computer access on the road while the computer system is protected from tampering by unauthorized users.

The modem contains a scrambled identification number that Digital Pathways' Defender II security system can verify, according to a spokesman for the vendor.

It is compatible with AT&T 212A, 103 and compatible modems and includes an intelligent serial-command interpreter.

The price is $575, according to the vendor.

Digital Pathways, 1060 E. Meadow Circle, Palo Alto, Calif. 94303.

LOCAL-AREA NETWORKS

AMERICAN PHOTONICS, INC.

RL5000

American Photonics, Inc. has announced a fiber-optic product designed to extend Ethernet local-area networks from the previous 165-ft maximum to more than 1,500 feet without a repeater.

The RL5000 Ethernet Extender is said to replace standard transceiver cable used in Ethernet installations with a pair of optical fibers. According to the vendor, the RL5000 can extend the distance between transceiver and workstation controller up to 1 kM in lightly loaded Ethernet installations.

It is available in tabletop and rack-mounted versions and costs $3,000, excluding the price of the fiber-optic cable.

American Photonics, 71 Commerce Drive, Brookfield, Conn. 06805.

ADVANCED COMPUTER COMMUNICATIONS

V/EIU

Advanced Computer Communications recently announced an interface designed to link minicomputers and microcomputers using the Motorola, Inc. Versabus and Ethernet local-area networks.

The Versabus/Ethernet Interface Unit (V/EIU) reportedly provides controller logic and performs physical and data link layer protocol functions in accordance with Ethernet and IEEE 802.3 requirements.

The product consists of a single printed-circuit board designed to plug into the Versabus host's backplane and to appear as a set of memory-mapped I/O ports with a 32K-byte block of dual-ported memory. According to the vendor, setup and initialization is controlled by the host, but all other access takes place through the dual-ported memory.

Available now, it costs $3,000, the vendor said.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101.

AUXILIARY EQUIPMENT

KINEX CORP.

Comdec-1B

Kinex Corp. has introduced a stand-alone data compression device, the Comdec-1B, said to be capable of compressing half-duplex, byte-oriented, bisynchronous protocols at a 1.5:1 ratio.

Comdec-1B reportedly enables a user to upgrade the operating speed of existing private-line or dial-up modems without replacing those devices. Alternatively, the device enables users to operate lines at lower speeds to minimize noise sensitivity.

At the 1.5:1 compression ratio, a 14.4K bit/sec data stream can be reduced, using the Comdec-1B, to 9,600 bit/sec. The vendor said security is provided via a coding algorithm.

The Comdec-1B, which is available now, can be installed with Kinex-supplied cabling.

Prices start at $1,500.

Kinex, 6950 Bryan Dairy Road, Largo, Fla. 33543.

WE'VE KEPT MORE THAN 800 VERY LARGE COMPANIES VERY HAPPY.

BY LEADING THE LEADER.

Our customers know one thing very well: they can count on NCR Comten 100% of the time.

It's important that we're the leading manufacturer of IBM compatible data communication systems. We continually lead the leader: our users get more system intelligence. More reliable software. Better service. And a business partner that stands beside them.

As a result, users are comfortable with their NCR Comten data communication systems. Oil and computer companies. Telephone companies. Manufacturing companies. More than 800 of them worldwide. Wherever the flow of business, industry or government depends on the certain flow of information, our customers depend on us.

Customers who choose NCR Comten stay with NCR Comten. To find out why, ask for our executive briefing. Write "Data Communications Systems," NCR Comten, Inc., 2700 Snelling Av. N., St. Paul, MN 55113. Or call **1-800-334-2227.**

KNOWN BY THE COMPANIES WE KEEP.

NCR
NCR Comten, Inc.

Office Automation. Future Included.

The Future. Every piece of Office Automation equipment from Philips Information Systems includes the future. We've developed a total Office Automation strategy to assure you that the decisions you make today will be right for tomorrow.

It's a strategy that lets you expand your Office Automation capabilities at your own pace. A strategy that makes sure the products you need are ready when you need them. A strategy that incorporates hardware and software solutions from standalone word processing to sophisticated local area networks and beyond.

Resources. Our parent, N.V. Philips, a 16-billion-dollar multinational corporation, is the third largest corporation specializing in communications and electronics, with 200 factories in over 100 countries and 300,000 employees worldwide.

We put the power of over one billion dollars in research behind our Office Automation systems. Technological firsts, from the original cassette recorder, to the videodisc and digital optical recorder, allow us to expand our Office Automation strategy in the future, while keeping compatibility intact.

Support. All products in the Philips Office Automation strategy are backed with an extensive guarantee and comprehensive user training and service.

To find out more about including Philips in your future, call 1-800-828-6211. In New York State 1-800-462-6432. Or, send the coupon.

Alexander Pickwick. The World's Foremost Office Automation Problem Solver.

Helping you solve the mysteries of Office Automation.

PHILIPS
INFORMATION
SYSTEMS

PHILIPS

Yes! I want to include Philips Office Automation in my future.

Please send me further information on your Office Automation strategy.

Name ____________

Title ____________

Company ____________

Address ____________

City ________ State ________ Zip ________

Mail to: Philips Information Systems, Inc.,
Marketing Services,
4040 McEwen, Dallas, TX 75234

CW 6/11

NET

from page 113

sec Ethernet baseband local net for control interfaces between nodes and for packet-switched data. When the token-ring specifications are standardized, the Ethernet interfaces will be employed as an optional gateway.

A Rose node communicates with the company's digital display phone, called the Personal Teleterminal, at 192K bit/sec. For data, users will initially be able to tap a 9.6K bit/sec packet channel and a 64K bit/sec data channel within that bandwidth. Additionally, under software control, users can combine a 64K bit/sec data channel with a digitized voice channel operating at the same speed to achieve a 128K bit/sec data channel.

Like CXC, Ztel uses a ring network to interconnect systems nodes. Each Private Network Exchange (PNX) node can support up to 2,000 ports, with a maximally configured switch handling up to 30,000 ports.

The PNX uses a circuit-switched ring for voice communications between nodes and to support 56K bit/sec synchronous data and 19.2K bit/sec asynchronous data traffic. Also resident in the system is a token-ring network modeled after the IEEE 802.5 standard. This net operates at 4M bit/sec and is used for system control and to provide for high-speed, packetized data. The vendor said the network can be operated at speeds up to 10M bit/sec and will eventually operate at a maximum speed of 16M bit/sec.

At the recent International Communications Association show in Las Vegas, Ztel demonstrated the use of this local net capability for the first time. Personal computers from IBM, Apple Computer, Inc. and Digital Equipment Corp. were attached to RS-232C interfaces on the back of the company's Z/28 digital display phones and were used to communicate with a DEC VAX computer and to access the Official Airline Guide data base.

A Ztel spokesman said that because the local network is integral to the switching system, a user is guaranteed to have the capability whether or not he plans to use it. This fact will appeal to users that are feathering their nests against future unknowns. For the most part, however, users don't seem ready to tap the resources of third-generation PBXs [CW, April 23], so how will they react to this latest generation of switches?

Does your
MICRO-TO-MAINFRAME
LINK
look like
this?

hundreds of companies
have installed
TEMPUS-LINK
because it provides:

☐ **simple file transfers** such as PC/DOS* Copy
☐ **better performance** than batch communications
☐ **executive friendly** for all PC/DOS applications
☐ **independence** from the communications devices
☐ **distributed processing** from PC/DOS applications
☐ **continuity** by adhering to PC/DOS standards

☐ TEMPUS-LINK micro operates under PC/DOS (or MS/DOS**) on IBM-PC* and many other compatibles.
☐ TEMPUS-LINK mainframe operates in CICS*, IMS*, TSO*, CMS* under DOS/VSE*, OS/VS1*, MVS*, VM*.
☐ TEMPUS-LINK supports major communication devices in 3270 and Asynch modes.

For information contact:
MICRO TEMPUS INC.
440 Dorchester Blvd. West, Suite 300
Montreal, Quebec H2Z 1V7
Phone: 514-397-9512
Telex: 055-61829
U.S.: (800) 361-4983

MICRO TEMPUS INC.

*Trademarks of International Business Machines Corp.
**Trademark of Microsoft Corporation

ATM

from page 113

telephone lines to Baybanks' electronic banking centers in Waltham and nearby Brookline, Mass. Technicians at the centers monitor those lines with Racal-Milgo, Inc. equipment and can bypass trouble spots as they occur.

"In the old days, we would have a lot of problems with telephone lines. Now we can identify the problem and in some cases temporarily fix it ourselves before the telephone company even knows there is a problem," Isaacs said.

To avoid situations where line trouble disables all machines at a site, Baybanks uses separate lines for adjoining ATMs. The nine machines at the Harvard Square site, for example, use four separate lines. "Our basic premise is that we have to suboptimize communications expenses to optimize reliability," Isaacs said.

Technicians monitor the ATMs' status with Diebold 6520 terminals that allow them to inquire about an individual machine's status and be alerted to changes in any machine's status. The technicians notify field service personnel about problems and inform nearby hot-line operators who handle calls from automatic-dial customer service phones at the ATMs.

At the heart of the network are 17 Tandem Computer, Inc. Non-Stop II processors, 10 of which are dedicated to the ATMs at any given time. Isaacs said that if either the Waltham or Brookline center is completely shut down, the five Non-Stop IIs at the second site can provide at least minimal network service immediately.

At present the Non-Stop IIs exchange account information with an IBM 4341 system based in Waltham. The 4341 provides information, such as account balances, which is transferred on tape daily from the bank's mainframes, an IBM 3081 and an IBM 3033 in a second Waltham building. Tapes from the 4341 update the mainframes on that day's Non-Stop II transactions.

STUDY

from page 113

stone." While not yet a factor in the marketplace, Strategic anticipates that sales of these systems will begin to erode the dedicated local net market by 1987 and have an increasing effect in subsequent years.

According to the report, the greatest percentage of networks today are installed in office environments, accounting for roughly 62% of all local net systems installed in 1983 and growing to 64% by 1988. Schools and universities accounted for about 12% of installed systems, roughly the same percentage represented by factory installation in 1983. By 1988, education will have grown to 14% and factories to 16%. Research and engineering sites, which comprise about 11% of the existing network installations, will become saturated and represent only 5% of the sites by 1988. Government/military sites, which account for the remaining 3% in 1983, will also become saturated by 1988 and account for only 1%.

The study, which was based on detailed interviews with vendors as well as with key individuals at 50 sophisticated user sites, costs $4,500. More information is available from G. Alan Baley, Strategic, P.O. Box 9747, San Jose, Calif. 95157.

SYSTEMS & PERIPHERALS

Study examines trade-in value for various used IBM systems

By James Connolly
CW Staff

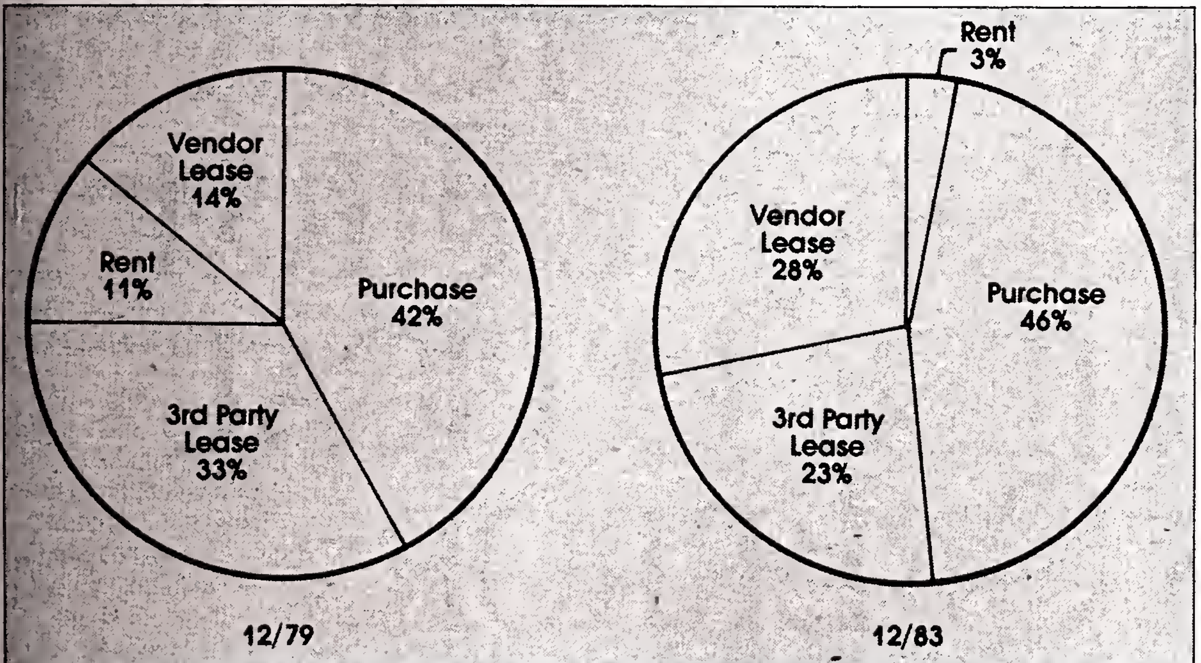
FRAMINGHAM, Mass. — When it's time to move on to a new system, what can the old IBM system in the back room bring in trade?

Trade-in values for used IBM systems range from well below 20% of list price for IBM 3033s to roughly 80% for IBM 3083s, according to a first-quarter residual value study by International Data Corp. (IDC), a research and consulting firm based here.

IBM's emphasis on its Extended Architecture and the anticipated announcement in early 1985 of IBM's next family of mainframes, dubbed the Sierra by some, drove the value of 3033s down during the first half of 1984, IDC said. "A fully loaded [3083 Model U processor], which traded in the high teens to low twenties in December, can now be had for somewhere in the ballpark of a quarter of a million dollars," the report said. "Although some large users run a mixed 3033/3080 series shop, there are presently not enough 3033 takers to absorb the increasing number of machines filtering into the used market, having been displaced by 3080s."

In contrast, IDC expects a continued active market for the Extended Architecture 3080 series machines and the 3080 X machines announced in February [CW, Feb. 27]. The market research firm said most of the activity in the 3080 market will be at the low end, where users have an upgrade

See **VALUE** page 126



IBM rent/lease purchase distribution

Chart courtesy of International Data Corp.

Ada training system offered by DG

WESTBORO, Mass. — Data General Corp. has announced a packaged Ada training system designed to help U.S. Department of Defense (DOD) contractors and commercial users who need Ada development capability and training for data processing personnel.

The Ada Training Environment (ATE) features a 32-bit DG Eclipse MV/10000 superminicomputer, on-site training and Rolm Corp. Ada Development Environment (ADE) software.

The configuration reportedly includes a CPU with 10M bytes of main memory, a system console, three 354M-byte Winchester disk drives and a tape drive.

The customer-site training course, "Introduction to Ada Concepts and Programming," is said to be a week-long series of lectures, case studies and laboratory instruction. ADE software reportedly is DOD validated, production-quality development software.

The system costs $380,000 from DG, which is located at 4400 Computer Drive, Westboro, Mass. 01580.

NAS announces lease plans, options, trimmed payments for mainframes

MOUNTAIN VIEW, Calif. — National Advanced Systems, Inc. (NAS) has announced two new monthly lease plans and lease options for its AS/6600 family of mainframes. In addition, NAS has said lease payments for its AS/6600 mainframes have been reduced by approximately 20%.

Monthly lease plan A allows new customers with an AS/6620, AS/6630 or AS/6650 mainframe, on a 48-month lease, to upgrade after the 24th month to an AS/8000 series or AS/9000 series system, the company said.

Under upgrade plan B, customers can apply a percentage of accrued AS/6600 lease payments toward the purchase of an AS/8000 series mainframe at the end of the leasing term. Lease plans of 12 to 48 months are available, the firm said.

Lease payments for NAS AS/6620, AS/6630 and AS/6650 have been reduced by 17%, 21% and 21%, respectively, according to the vendor.

NAS is located at 800 E. Middlefield Road, Palo Alto, Calif. 94303.

HARD TALK
Tom Henkel
CW Senior Editor

Ideas, confusion in optical arena

There has been a lot of talk about, but relatively few customers, for optical disk storage. While many industry watchers contend there is an extremely bright future for optical disk storage, there appear to be some initial acceptance hurdles that have to be overcome.

A recent report released by International Data Corp. (IDC) of Framingham, Mass., [CW, April 23] noted that many potential users of optical storage shy away from the technology because they do not really understand its advantages and disadvantages. For example, the report noted the general consensus among users is that optical disks cannot be erased. The IDC report pointed out that some optical technologies can, in fact, be erased.

The IDC report also noted that reliability questions about optical disk products have also caused some manufacturers to steer clear of the burgeoning market. This has had a significant impact on development of optical disk drives for the DP marketplace, where high data reliability is a key concern. It has also kept the price of optical storage systems fairly high, IDC noted.

Perhaps it is just because optical storage is comparatively new that some users are a little concerned about jumping on the bandwagon. For example, most companies making optical disk products contend information stored on optical media will far outlast information stored on conventional magnetic media. They are probably right in their predictions of optical media's 15-plus years of reliability; however, try explaining those reliability theories to an irate user who has just discovered that extremely important archived information has deteriorated.

The DP executive is pulled in two directions when it comes to deciding on new technology. On one hand, the executive is charged with providing users with the best technology the company can afford. On the other hand, he must be convinced that a new technology works and that users will receive quality service from its implementation. Since many DP executives' jobs depend on that latter consideration, you can be sure few will run out and buy optical storage products until they are convinced they will live up to high expectations.

Even when all the reliability questions are resolved, getting users to make the move over to optical storage may remain a problem. It is clear that for most organizations, there will never be a dramatic switch to optical disk drives. Many companies have literally tons of data stored on magnetic tape. Transferring that data from magnetic to optical formats would be outrageously expensive — if not physically impossible.

Instead, most industry watchers agree optical storage will be integrated into business DP in segments. Perhaps one or two departments will experiment with

See **OPTICAL** page 126

■ California Computer Products, Inc. unveils a 32-bit computer-aided design system/**123**

INSIDE

Turnkey Systems/**123**
Processors/**123**
Data Storage/**124**
Printers/Plotters/**124**
Graphics Systems/**124**
Power Supplies/**125**
Board-Level Devices/**125**
Auxiliary Equipment/**125**

HOW TO PROTECT YOUR COMPUTER SERVICE FIRM AGAINST THESE TYPICAL SOURCES OF ERROR.

No matter how skilled you or your staff may be, there are still bound to be errors now and then.

But when another company hires you or your firm to perform a computer service for them, an error can have costly repercussions.

And you or your firm could end up responsible.

For example, what would happen if someone's error causes one of your computers to issue more payroll checks than it should?

Or if a mistake in a computer's accounting program puts a halt to a client's business-as-usual?

You don't need a computer to calculate that the lawsuit costs from errors such as these could be too steep to handle.

And you can't always rely on a "hold harmless agreement" to protect you either, because a court of law can invalidate it and find you liable anyway.

That's why National Union Fire Insurance Co. of Pittsburgh, Pa. is offering Electronic Data Processors Errors & Omissions Insurance. It's designed to protect fee-based computer service firms against financial losses from claims made against them for wrongful acts occurring during the performance of services for others.

One of the most comprehensive EDP E&O policies on the market today. Unlike some EDP E&O policies, ours isn't limited to covering data processing, programming, or software designing. It also covers consulting and providing advice and opinions.

What's more, National Union has been a well-known and respected source for professional liability coverages for nearly two decades now. And that means you can count on our experience and stability to back up every policy we issue.

So remember: as the demand for outside computer services increases, so will the potential risks. Which means there's one error you can't afford to make—leaving yourself or your firm unprotected by National Union's EDP E&O Policy.

ONCE AGAIN
THE ANSWER IS AIG.

(Policy provisions are only briefly highlighted here. Refer to policy forms for complete details.)

☐ Send me more information on EDP E&O coverage from National Union.

Name Title

Company

Address

City State & Zip

Return to:
National Union Fire Insurance Co. of Pittsburgh, Pa.
Dept. A, 70 Pine Street, New York, N.Y. 10270

Calcomp offers CAD system, 9100 series digitizer

ANAHEIM, Calif. — California Computer Products, Inc. has announced a computer-aided design (CAD) system featuring a 32-bit processor, distributed processing and a modular building approach.

The company also announced its 9100 series digitizer, which is designed for entering graphic information into a computer or automated design station.

The CAD system is called System 25 and is based on a Masscomp central processor using a Motorola, Inc. 68000 microprocessor and an Intel Corp. Multibus interface. It supports Bell Laboratories, Inc. and University of California at Berkeley Unix and can be connected to a Digital Equipment Corp. VAX-11 series computer, according to Calcomp.

System 25 is targeted to design and drafting applications in the architectural, engineering, construction and facilities planning markets. It is said to generate bills of material automatically, create or edit drawing and plans, generate ancillary information from electronically stored drawings and control design information.

It can be used as a single-user, stand-alone system or in a multiuser or mainframe system.

The main design station includes two displays, a 12-in. alphanumeric screen and a 20-in. monochrome or 19-in. color graphics screen. The alphanumeric screen displays operator prompts and messages without interrupting information on the graphic display, according to Calcomp.

System 25 also includes an application processor with 1M byte of memory to perform design calculations, while Calcomp's picture processor utilizes a separate series of microprocessors to perform display processing. The application processor also contains a 20M-byte disk drive and a backup 1M-byte floppy disk unit.

Scheduled for shipment this month, System 25 is priced starting at $65,000.

The 9100 series digitizer is intended for OEM, industrial and business applications.

According to the vendor, it is compatible with Calcomp's 9000 series digitizer and uses the firm's ratio technique of electromagnetic technology to produce a resolution of 1,000 line/in. and accuracy of ±0.005/in.

The basic 9100 series system includes a tablet with processing electronics, an interface card, transducer and power supply. The standard opaque surface comes in three sizes, with active digitizing areas measuring 24 by 36 in., 36 by 48 in. and 44 by 60 in.

It reportedly can be operated with either a pen stylus or a multibutton cursor. Scheduled for July deliveries, it costs $4,600 for a typical configuration with a 36- by 48-in. digitizing surface, processor electronics, power supply and 16-button cursor.

Calcomp is located at 2411 W. La Palma Ave., Anaheim, Calif., 92801.

TURNKEY SYSTEMS

MOTOROLA, INC./
FOUR—PHASE SYSTEMS, INC.
5000 series enhancements

Motorola, Inc./Four-Phase Systems, Inc., a joint venture, has announced enhancements to its 5000 series of clustered terminal processors, which are compatible with the venture's 4000 series of office information systems.

An improved hardware architecture allows the 5000 to support up to 64 workstations, character printers and line printers, while providing up to four times the processing speed of the 4000, according to the vendor. Other features of the 5000 series include the multidropping of up to eight workstations from a single coaxial cable and the attachment of each printer directly to a workstation.

Performance gains are due to a faster processor, memory and logic circuits, the vendor said. The Model 800 in the 5000 series is made faster by incorporation of a cache memory in the central processor.

Both the 700 and 800 models in the 5000 series support 1.5M bytes of random-access memory.

The following is a sample configuration purchase price: The 700, with 33 Motorola/Four-Phase Fastrak workstations, 1.5M-byte memory, two 138M-byte disk drives, one 600 line/min printer and 10 printers in 35 char./sec range, is priced at $181,904.

Motorola/Four Phase, 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

PROCESSORS

SYMBOLICS, INC.
Symbolics 3670

Symbolics, Inc. has announced the Symbolics 3670 symbolic processing system, which is said to offer improvements in capacity and perfor-

Continued on page 124

Internal modem direct-connects to any telephone network.
Standard 132 columns (compressed print) add wide format for spread-sheets, financial data.
Full-size keyboard is a practical tool.
Exclusive program cartridges add custom functions now; added expandability later.
All you appreciate in the 745 and more — in an even smaller, lighter package.
Rechargeable battery puts you in the know wherever you go.
TI Silent 700™ operation won't add noise to surroundings.
Texas Instruments

Only Texas Instruments packs more portable terminal into less space.

Here's a brief case for the Texas Instruments *Silent 700*™ Model 707 Portable Data Terminal.
It's the latest and lightest in a long line of standard-setting *Silent 700*™ terminals. And it's the most versatile full-function portable anyone can pack into a briefcase.

By carrying TI's Model 745 one step further, we made the best even better. The 707's standard internal modem connects to any telephone network while the optional acoustic coupler and battery pack make it fully portable. The spreadsheet size 132-column printer is now standard. And TI's solid state plug-in cartridges can add functions for your current use and later expansion.

For the standard-setting terminal that packs more product into less space, get the TI Model 707. At only six pounds, it packs more full-size functions than any other portable ... all at a surprisingly low price. For more information contact: Texas Instruments Incorporated, P. O. Box 402430, Dept. DTB-163OW Dallas, Texas 75240. Telephone 1-800-527-3500.

TEXAS INSTRUMENTS
Creating useful products and services for you.

Copyright © 1984 Texas Instruments ™ Silent 700 is a trademark of Texas Instruments Incorporated.

2763-39MIS

SYSTEMS & PERIPHERALS

Continued from page 123

mance over the Symbolics 3600 processor.

The 3670 has 14 optional expansion slots, compared with seven slots on the 3600. The 3670 can support up to 30M bytes of physical memory and a virtual memory of 1G byte of address space, according to the vendor.

The 3670 I/O processor speeds video operations up to 2½ times, the vendor said. Standard 3670 disk drive options are 167.5M- or 474M-byte fixed media disks, or a 300M-byte removeable media disk. An optional expansion cabinet can hold up to four disks, each with 474M bytes. The 3670 supports a total of eight disk drives for a total of 3.7G bytes.

An optional ¼-in. cartridge tape drive is available for software updates and backup.

The base price of a 3670 processor, including 2M bytes of memory and the 167.5M-byte disk, is $84,500, the vendor said. Shipments are scheduled to start this summer, according to the company.

Symbolics, 12th Floor, 4 Cambridge Center, Cambridge, Mass. 02142.

DATA STORAGE

ALLOY COMPUTER PRODUCTS, INC.
IDS-412

Alloy Computer Products, Inc. has announced a 17.6M-byte cartridge tape system for use with microcomputer systems utilizing small computer standard interface controllers.

The IDS-412 is a ¼-in. unit designed to write data at 1M byte/min. It reportedly features rewind, track select and file orientation for data access. According to the vendor, it is intended as a backup for Winchester disk drives and for logging and file applications.

An Alloy Computer Products spokesman said that it runs with various systems, including all microcomputers made by Digital Equipment Corp.; Fujitsu Microelectronics, Inc.; ICL, Inc.; and Hitachi America, Ltd.

It costs $2,295.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

PRINTERS/PLOTTERS/ PERIPHERALS

QUALITY MICRO SYSTEMS, INC.
Lasergraphix 800 Model I

Quality Micro Systems, Inc. has announced an intelligent laser printer designed to replace daisywheel printers, dot matrix printers and pen plotter devices.

The Lasergraphix 800 Model I is said to be a 54-lb desktop unit based on Canon U.S.A., Inc. PC10 and PC20 copying technology. It reportedly allows Diablo Systems, Inc. Diablo 630 daisywheel simulation; Qume Corp. Sprint 9/11 simulation; automatic bar and pie chart generation; Tektronix, Inc. Tektronix 4010- and 4014-compatible plotting; optical character recognition and bar code printing; line and box drawings; multiple forms overlay and reverse image printing.

It reportedly can bit-map 8½- by 11-in. and 8½- by 14-in. pages and is said to produce eight pages per minute. It features a user-replaceable cartridge which contains 70% of the serviceable parts, including toner and the drum, according to the vendor.

Available 60 days after receipt of order, it is priced at $9,995.

Quality Micro Systems, P.O. Box 81250, Mobile, Ala. 36689.

DIGITAL LABORATORIES, INC.
Multispool Printer Sharing Systems

Digital Laboratories, Inc. has announced a family of printer sharing systems for personal, minicomputer and host computer systems. The units were designed to reduce system configuration costs and compatibility problems.

Multispool Printer Sharing Systems are said to allow simultaneous direct output from any combination of 17 computers to up to five serial and parallel printers.

Four models, ranging from two serial ports up to 18 serial and parallel ports, are available. They range in price from $595 to $4,895.

Digital Laboratories, 600 Pleasant St., Watertown, Mass. 02172.

GRAPHICS SYSTEMS

CADNETIX CORP.
CDX-1200; CDX-7100; CDX-7200

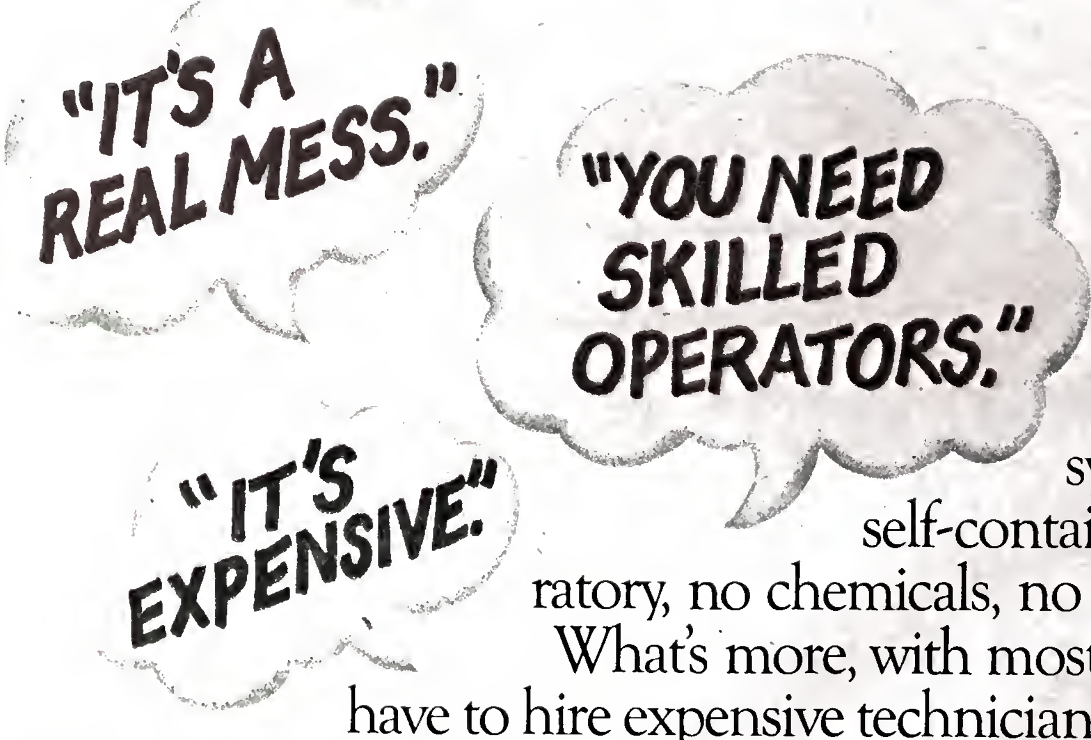
Cadnetix Corp. has announced a Xerox Corp. Ethernet hardware and software package designed to link its CDX-5000 and CDX-5001 computer-aided design workstations and server nodes. The product is said to provide additional storage and peripheral device access.

The CDX-1200 reportedly allows all workstations on a network to utilize common files on other workstations and to share output devices such as plotters, printers and tape drives.

The CDX-7100 and CDX-7200 file and peripheral servers feature Winchester disk storage formatted capacities of 120M bytes for the CDX-7100 and 240M bytes for the CDX-7200.

The file servers were designed as common file storage centers for all systems on the network. They use the CDX-1010 magnetic tape drive for backup.

Deliveries of all three products are


"IT'S A REAL MESS."
"YOU NEED SKILLED OPERATORS."
"IT'S EXPENSIVE."

Forget all the
you've ever
in-house CO

Today's COM from Bell & Howell is a whole different story. Our 6650 is a compact, dry system that's totally self-contained. There's no laboratory, no chemicals, no water. Nothing!

What's more, with most COM systems, you have to hire expensive technicians. And put up with frustrating operating procedures that often cause delays.

But not with the 6650. It was designed specifically for DP environments. It's as easy to operate as most line printers. So your staff can use it with minimal training. And because it operates online, it can produce your data in real time.

All you have to do is enter a few simple English language commands. The 6650's software will take over from there.

COM PRODUCTS

IBM is a registered trademark of International Business Machines Corporation.

scheduled for late in the third quarter of 1984.

The CDX-1200 Ethernet package, including an I/O card, transceiver, 15 feet of transceiver cable and software, costs $5,000. The CDX-7100 File and Peripheral Server is priced at $39,900, and the CDX-7200 File and Peripheral Server costs $53,900.

Cadnetix, 5797 Central Ave., Boulder, Colo. 80301.

AVL, INC.
PC2

AVL, Inc. has introduced an enhanced version of its PC1A graphics system that reportedly uses a puck and a digitizing tablet.

The PC2 features a 19-in. color display monitor and a 12-in. monochrome programming field monitor. It contains a 512K-byte CPU using an Intel Corp. 8086 microprocessor and an Intel 8087 floating-point coprocessor, a 380K-byte floppy disk drive and a 10M-byte Winchester hard disk drive.

The unit has dedicated software for presentation graphics, a vendor spokesman said.

Using the puck on the PC2 reportedly enables users to trace existing artwork for capture onto a disk library for recall and later use on demand.

Standard output for the unit includes RS-232C for connection to video system and computer commmunications networks, the spokesman said.

The PC2 costs $15,995.

AVL, 500 Hillside Ave., Atlantic Highlands, N.J. 07716.

POWER SUPPLIES

SOLA ELECTRIC
Electric computer power center

Sola Electric has announced a computer power center that is said to protect sensitive electronics devices from common ac power line irregularities, except total line failure.

Hard-wired and portable plug-in models are available, the vendor said. The power center holds output voltage steady within 3% when input voltages fluctuate as much as 15%, according to the vendor. Brownout protection is provided by holding output voltage within National Electric Manufacturers Association voltage specifications, despite line voltage drops of up to 65%.

The power center also features transverse-mode noise attenuation exceeding 60 db and common-mode noise attenuation better than 120 db. The power center is available in 60Hz single-phase models rated for 5,000 to 15,000 VA loads and 60Hz three-phase models with outputs of 7,500 to 15,000 VA.

The price ranges from $3,500 to $5,700, depending on the VA range and the output receptacles required, according to the vendor.

Sola Electric, 1717 Busse Road, Elk Grove Village, Ill. 60007.

BOARD-LEVEL DEVICES

TELEVIDEO SYSTEMS, INC.
914GR; 924GR; 970GR

Televideo Systems, Inc. has announced graphics boards that will allow Televideo's 914, 924 and 970 model terminals to run Tektronix, Inc.'s scientific and engineering graphics software.

With the boards, users can run Tektronix Plot 10 graphics or compatible graphics software. The graphics boards, called 914GR, 924GR and 970GR, provide eight line types, 32K bytes of display random-access memory and 640- by 240-pixel resolution.

The 970GR is compatible with Digital Equipment Corp.'s systems and has a separate Zilog, Inc. Z80 microprocessor and memory plane.

The price for the 914GR and 924GR is $525, and the price for the 970GR is $970, the vendor said.

Televideo Systems, 1170 Morse Ave., Sunnyvale, Calif. 94086.

SELANAR CORP.
SG240 graphics board

Selanar Corp. has announced the SG240 graphics board that offers 800- by 240-pixel resolution.

The unit includes Tektronix, Inc.'s 4010/4014 emulation, Tektronix Plot 10 compatibility and a built-in cross hair cursor, the vendor said.

The SG240 is a single board with plug-in installation. Hard copy can be generated on a variety of dot matrix printers or high-resolution pen plotters.

The board is priced at $795, the vendor said.

Selanar, 437-A Aldo Ave., Santa Clara, Calif. 95050.

AUXILIARY EQUIPMENT

J&W INSTRUMENTS, INC.
Digi/Scan 10C

J&W Instruments, Inc. has announced a programmable data logger with CRT display and printout recording for a cost of less than $5,200 per 16-channel unit, targeted at the food processing, chemical, oil and metals industries.

The Digi/Scan 10C allows either single-channel process value display or a full 11-channel display in multiple mode, according to the vendor. The unit reportedly continues scanning up to 16 channels while displays are called on demand.

RS-232C interfaces are available on two ports per card.

J&W Instruments, 4800 Mustang Circle, New Brighton, Minn. 55112.

See **AUXILIARY** page 126

dirty stories
heard about
M printing.

It can handle microfiche production. Create and maintain job setups. And even produce audit trails. All at the same time.

Meanwhile, you won't have to interfere with your host computer's software because the 6650 has its own minicomputer and emulates an IBM® 3211 printer.

And here's another surprise: Your end users will appreciate the sharp, clean images from the 6650's dry process.

Isn't it time you learned more about Bell & Howell's clean new approach to COM? Call our marketing manager toll-free at (800) 538-4000.
In California, call collect, (714) 660-1050.

1. To load the 6650, simply insert the film. There are no messy chemicals.
2. When you're ready to print, it's easy. Just press a button.
3. Your fiche will be ready in seconds—for a fraction of what it would cost to put the same data on paper.

BELL & HOWELL
COM DIVISION

SYSTEMS & PERIPHERALS

AUXILIARY

from page 125

DOLCH LOGIC INSTRUMENTS, INC.

96300 trace unit

Dolch Logic Instruments, Inc. announced a plug-in trace unit designed to let Dolch's Colt and Atlas virtual systems perform measurement, analysis and troubleshooting tasks.

The 96300 trace unit reportedly configures the Colt or Atlas for logic-analysis applications.

It provides 16 channels for asynchronous data recording at sample rates up to 300 MHz or synchronous recording at up to 100 MHz.

It is priced at $5,950.

Dolch Logic Instruments, 3052 Orchard Drive, San Jose, Calif. 95134.

STRUTHERS—DUNN, INC.

RS-232C to RS-422 adapter

Struthers-Dunn, Inc. has announced an RS-232C to RS-422 adapter that allows an RS-232C-compatible device, such as a computer, to communicate on an RS-422 communications link at distances up to 4,000 feet.

The RS-422 link allows up to 10 RS-422 devices to be multidropped on one line. A computer system, through a single RS-232C port, can communicate with 10 RS-422 devices such as printers or other computers on an RS-422 line.

The adapter is priced at $255, the vendor said.

Struthers-Dunn, Systems Division, P.O. Box 1327, Bettendorf, Iowa, 52722.

VALUE

from page 121

path. IDC continued that Sierra likely will be a high-end machine that will "extend the viability of the 3080/3080 X market."

IDC said IBM's announcement of the 3080 X models lowered the value of non-X 3080 machines, but the 3083s generally trade at roughly 80% of their retail value, while 3081 Model K processors trade at roughly 70% of their retail value. Lower end non-X 3080 models bring proportionately less.

IDC predicted that the 3080 X model machines eventually will trade proportionately higher than the non-X models.

The announcement of the 3080 X models also shook up the IBM 4300 market, according to IDC, with values for the 4341 running from the low 40% percentile to the upper 50% level. IDC said IBM's push for the 4381, which can use IBM's MVS/XA operating system, will cause 4341 prices to drop as users find that the MVS migration path ends at the 4361.

Trade-in prices for the System/34 stabilized in the mid-40% range after the announcement of the System/36. Demand for smaller CPUs has waned in light of the booming microcomputer market, according to the report. IDC predicted that System/34 values will undergo a gradual decline as users migrate to the System/36 through upgrades and purchases.

IDC said low-end System/38 units lost value as new models became available and users migrated to larger models within the line. By the beginning of 1985, the residual retail value of the System/38 will range from 55% for Model 4 to 74% for Model 8, according to IDC.

Among IBM office systems, used Displaywriters are selling at 70% to 75% of list price, up by several points over late 1984, because of strong user support, IDC noted.

The IDC residual value study, part of the firm's Information Systems Planning Service, costs $2,500. IDC is located at 5 Speen St., Framingham, Mass. 01701.

OPTICAL

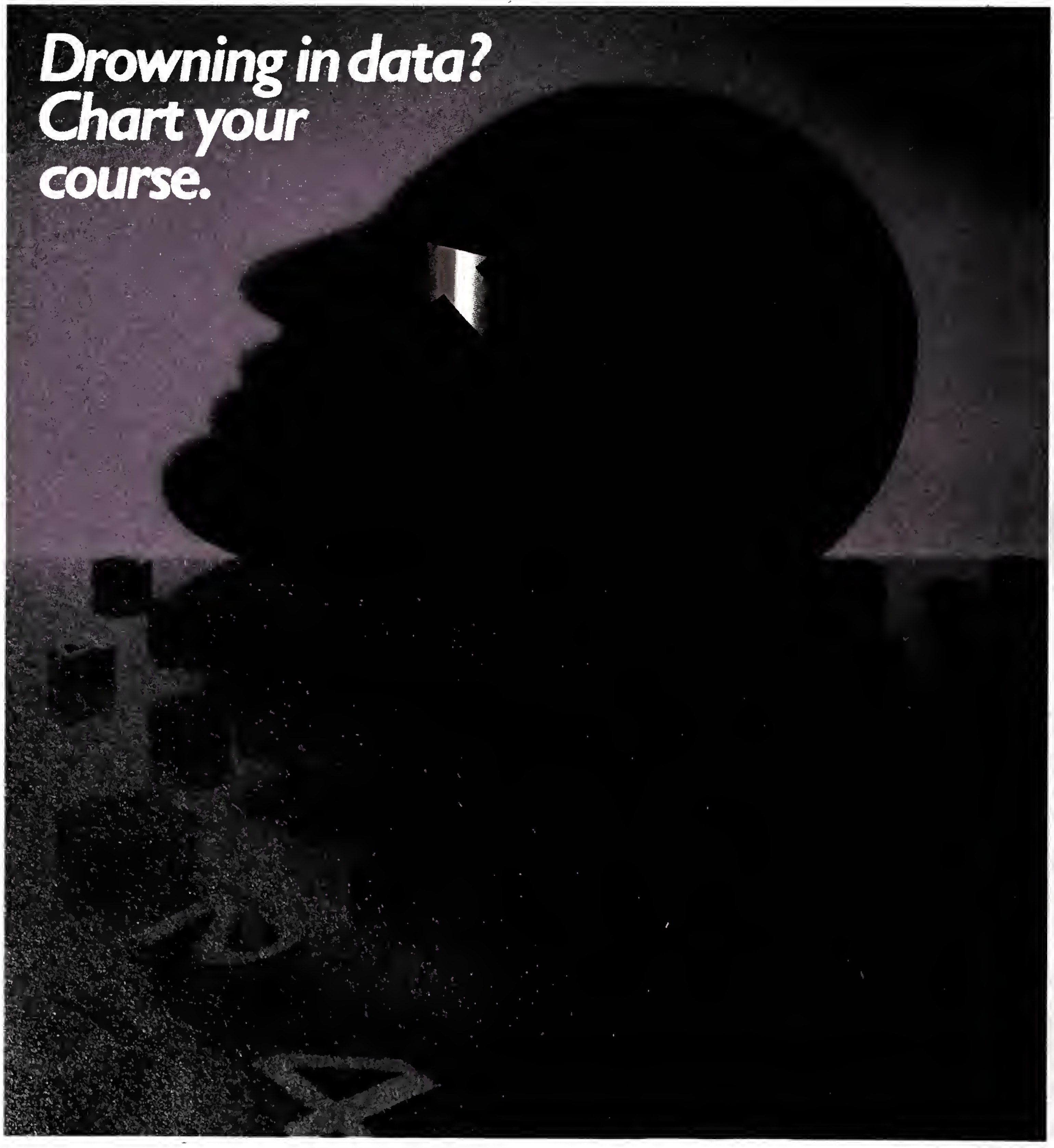
from page 121

optical storage. If they have positive results, more departments will embrace the technology. At that rate, it will take years before optical storage even starts to challenge magnetic media as the most popular technology.

Using optical storage as a replacement for micrographics systems currently appears to be the most attractive avenue makers of optical storage systems have for slipping units into users' hands. In fact, a recent report released by Strategic, Inc. in San Jose, Calif., suggests that optical storage will probably displace micrographics systems in a few years. The Strategic study goes on to state that the optical storage vendors who will experience the most success will be those who develop systems for new applications.

There is currently a lot of research being done in efforts to create better ways of storing information optically. For example, Phillips Research Laboratories has been experimenting with organic dyes that absorb a great deal of light and have a high degree of reflectance. According to Phillips, the experimental organic dyes may eventually offer an alternative to the more commonly used tellurium-selenium alloys. Phillips, as well as others, is also experimenting with magneto-optical materials. The research may someday yield an easily erasable medium that offers a low enough signal-to-noise ratio to be able to handle digital data and possibly video signals.

Even the Soviets are getting into the optical research arena. International Research Development, Inc. (IRD) in Norwalk, Conn., reports the Soviets have developed a prototype optical memory system that makes use of microholograms. The Soviet system, IRD said, is based on a series of plates about 5 cm square. A computer-controlled playback machine stores a number of these plates, selects the desired plate and displays a holographic image on a television monitor.


Drowning in data?
Chart your course.

Are you drowning in data that's hard to read and even harder to understand?
Chart your course with the Presentation and Business Graphics package (P.B.G.) by GANESA. With P.B.G., you transform columns of numbers into easily understood charts and graphs. Cumbersome statistical data becomes useful information, ready for you to analyze, display and present.

Designed for the IBM PC and compatible computers, P.B.G. works with your own data and all popular spreadsheets and databases. This superior graphics software is unique in its speed, ease of use and the flexibility of its display options.

Menu-driven, you can learn to use P.B.G. in less than an hour, create graphs in minutes and edit them in seconds. Everything from bar charts to population pyramids can be previewed on your monitor, assembled into a slideshow presentation with test screens or produced as report-quality graphics by plotter or camera.

At only $395, you'll be amazed at what P.B.G. can do for you and your data. For a dealer nearest you, call or write GANESA today. *GANESA also offers STATMAP, a data-driven marketing, statistical and demographic mapping package.*

Send me more information on P.B.G. ☐ and STATMAP ☐.

Name__________

Title__________

Company__________

Address__________

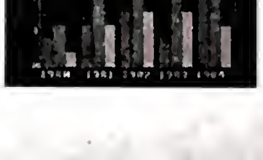
City__________ State_____ Zip_____

Telephone (_____)__________

GANESA
1495 Chain Bridge Road, Suite 300
McLean, VA 22101
800/638-2225 Toll Free.
In Virginia: 703/442-0442

J-9

*GANESA, STATMAP and P.B.G. are trademarks of GANESA Group International, Inc.
*IBM PC is a trademark of International Business Machines Corp.



MICROCOMPUTERS

■ Word processing software for scientific uses is introduced by Lifetree Software, Inc./**128**

■ NBI, Inc. unveils two personal computer workstations/**128**

■ Seequa Computer Corp. introduces a transportable micro with color graphics features/**128**

■ D & B Computing Services launches an IBM Personal Computer XT/370 version of its Nomad2 software/**130**

■ ACT, Inc. announces a hard-disk personal computer/**130**

INSIDE

Software/**130**

Communications/**131**

Systems/**134**

Storage/**134**

Board-Level Devices/**134**

Auxiliary Equipment/**134**

Printers/Plotters/**136**

IBM-compatible, multiuser micros make debut

By Eric Bender
CW Staff

In departmental or small-business applications, multiuser microcomputers that run off-the-shelf IBM Personal Computer software represent an attractive alternative to stand-alone or networked personal computers, proponents say. The first wave of multiuser micros claiming IBM compatibility arrived in recent weeks, with many systems making their debut last month at Comdex/Spring '84 in Atlanta.

Vendors claimed the new systems combine the traditional virtues of multiuser micros — sharing processing power and other resources inexpensively among multiple users — with the ability to tap the huge base of IBM Personal Computer application software.

Prices per user remain much lower than costs for networked personal computers, said Dharam Ahuja, senior vice-president of marketing and sales at North Star Computers, Inc. of San Leandro, Calif. As one example, a five-user version of North Star's Dimension with 30M bytes of hard disk storage costs $12,500, half the cost of networked IBM Personal Computer XTs, Ahuja said. "The system is cost-justified at the two-user level," he maintained. "The more users, the better the system looks in price and performance."

However, competing vendors pointed out limitations for the new systems. Some multiuser systems based on a single CPU, unlike Dimension, offer lower performance, while all are vulnerable to system-wide crashes and provide limited expansion options, local-area network suppliers remarked. Meanwhile, suppliers of other multiuser micros noted the current lack of true multiuser applications software written for Microsoft, Inc.'s MS-DOS operating system.

A prime stumbling block on the road to Personal Computer-compatible multiuser systems was the lack of multiuser MS-DOS,

See **MULTI** page 133

Micro-mainframe link solutions already here, exec says

By Paul Korzeniowski
CW Staff

FT. LAUDERDALE, Fla. — Current industry standards provide solutions to the MIS problems that managers experience with microcomputer-to-large system links, according to Randy Broweleit, chairman of The Business Library, Inc.

Speaking late last month at the "Personal Computer and Workstation Trends and Applications for End-User Productivity" conference here, sponsored by Enterprise Informations Systems, Inc. of Greenwich, Conn., Broweleit listed five reasons for linking a microcomputer to a mainframe. These include terminal emulation, electronic mail, access to third-party data bases, reduction of mainframe data processing time and use of data by different applications.

Present products provide these functions, Broweleit said. "There are a number of terminal emulation packages available, some of which allow a microcomputer to emulate 15 to 25 types of terminals," he observed.

Broweleit noted that vendors of local-area network packages offer users electronic mail capability. In addition to this feature, local-area networks tie personal computers, network servers and mainframes together and cut the cost of supporting expensive peripherals, Broweleit said. Nodes running several stations can be added and subtracted as desired.

See **LINKS** page 136

Integrated package offers menu-driven applications creator

SALEM, N.H. — Softrend, Inc. began shipments of its Aura integrated software package, a menu-driven applications development system for the IBM Personal Computer selling for $495, on schedule late last month. The firm also announced a communications program designed to work with Aura.

Aura features four basic modules — a data base manager with application generation capabilities, word processing, spreadsheet and graphics, said Softrend President David Wetherell.

"We have a dozen major capabilities beyond what [Lotus Development Corp.'s] Symphony and [Ashton-Tate's] Framework can do," Wetherell claimed.

Aura permits nontechnical users to do their work totally through menu choices, to design their own menus in straightforward fashion and to establish their own program sequences with up to 32 steps, Wetherell said.

The company also will offer the application generator and a development tool kit to independent authors who can develop applications for vertical niches, Wetherell said. Third-party developers will be able to offer their programs themselves or through Softrend marketing efforts, he added. Softrend also will encourage similar application development among consultants.

The program's data base manager can execute report, select, edit and index functions through a simple menu-driven, fill-in-the-blank user interface, according to Softrend. Data from this module can be in-

See **AURA** page 132

Comdex/Spring '84: A showcase of industry hits, misses, trends

SMALL TALK
Eric Bender
CW Senior Editor

Like other carnivals, each Comdex computer dealer show features established crowd pleasers, new hits and many sideshows. Among the hits, misses and trends at Comdex/Spring '84 three weeks ago in Atlanta:

■ There was no big Mac attack from Apple Computer, Inc. Merely locating new Macintosh software was a full-time project. Many vendors are extending their shipping schedules — for example, Lotus Development Corp.'s 1-2-3/Symphony version for the Macintosh now is not expected to appear until next February.

"February is a long time off," said Amy Wohl of Advanced Office Concepts Corp. "I have the same concern for the Mac I had for the Lisa — when it's ready, will anyone be around to look at it?"

The hardware side appeared brighter, as third-party hardware suppliers are busily filling gaps in the Macintosh product line. And although no product was announced, Macintosh product manager John Rizzo said that the laser printer expected this summer from Apple would end criticism about lack of letter-quality output.

■ AT&T had the largest booth in the computer dealer show, and one of the busiest. In one display, an IBM Personal Computer and a Compaq Computer Corp. portable hooked up through AT&T's PC Interface to the 3B2 supermicro, with files stored on the 3B2's hard disk drive. AT&T is expected to display other personal computers — carrying an AT&T logo — at the National Computer Conference a month from now in Las Vegas.

■ Site licensing for microcomputer software, particularly software delivered over a local-area network, is on the upswing. "A lot of software vendors are resisting it, but you'll see that change dramatically over the next twelve months," predicted 3Com Corp. President William Krause. "The customer wants it, and the customer always wins."

■ A flood of knee-top micros is about to burst upon the market, offering built-in applications programs and other handy advanced features. But readable displays remain scarce. At several brightly lit booths featuring portables with LCD screens, it was almost impossible to tell if the devices were running.

■ The sneakiest marketing idea at Comdex — a show where computer salespeople sell to computer salespeople — was still a rumor: Ashton-Tate would offer a $200 upgrade from Lotus's 1-2-3 to Ashton-Tate's Framework package.

Buttonholed on the exhibit floor, Ashton-Tate President David Cole said the idea was worth considering, but that no decision had been made. "I wish they would do it," joked Lotus marketing head Jim Manzi. "We don't make money on our upgrade." More seriously, Manzi added that it took Lotus months to plan the logistics for 1-2-3-to-Symphony upgrades.

See **COMDEX** page 136

NBI adds micros to OA family

BOULDER, Colo. — NBI, Inc. has added two new products to its family of office automation workstations, the Oasys 4100S and Oasys 4100X personal computers.

While the new systems act as stand-alone personal computers, they can also share information, peripherals and word processing with NBI's line of office workstations, according to the vendor.

The Oasys 4100S is available with one or two 5¼-in. floppy disk drives, while the Oasys 4100X has one floppy disk drive and 10M bytes of hard disk storage. Both the 4100S and 4100X are said to run most off-the-shelf software developed for the IBM Personal Computer and Personal Computer XT without modification.

Both the 4100S and 4100X are said to offer 128K bytes of random-access memory, amber display, color graphics capability, one parallel port and two serial ports. The products feature tilt-and-swivel display and a detachable keyboard with 10 programmable function keys, according to NBI.

The 4100S is priced at $3,095 with a single disk drive and $3,645 with dual-disk drive. The 4100X is priced at $5,695, the vendor said.

NBI can be reached through P.O. Box 9001, 3450 Mitchell Lane, Boulder, Colo. 80301.

Portable color micro unveiled

ODENTON, Md. — Seequa Computer Corp. has introduced the Color Chameleon, said to be the first transportable color microcomputer compatible with the IBM Personal Computer and with Digital Research, Inc.'s CP/M 80 operating system.

Priced at $3,595, the system is designed for users for whom "color graphics and portability are an important combination," said James Hoffman, marketing vice-president.

The Color Chameleon features 384K bytes of random-access memory (expandable to 640K bytes), Intel Corp. 8088 and Zilog, Inc. Z80 processors, a built-in, 9-in. color monitor providing 640- by 200-pixel resolution with 16 colors, and dual 320K-byte, 5.25-in. floppy disk drives. The system also reportedly includes an enhanced IBM-style keyboard, real-time clock, serial port and parallel port.

In addition, the machine's bundled software includes Micropro International Corp.'s Wordstar; Sorcim Corp.'s Supercalc3; Perfect Software, Inc.'s Perfect Writer and Perfect Calc; Condor Computer Corp.'s Condor I; and Microsoft, Inc.'s MS-DOS and GW-Basic.

Shipments are scheduled to begin in July.

Seequa also introduced the Seequa PC, a desktop version of the company's IBM-compatible Chameleon.

The system is said to feature 128K bytes of random-access memory (expandable to 640K bytes), Intel 8088 and Zilog Z80 processors, one floppy disk drive, five internal expansion slots, bundled software, IBM-style keyboard, serial port, parallel port and red, green and blue video output. The system lacks a monitor, the vendor said.

Deliveries are expected this month. The system is priced at $1,995, according to the vendor.

Seequa is located at 8305 Telegraph Road, Odenton, Md. 21113.

Lifetree offers word processor, bit-mapped tool

MONTEREY, Calif. — Lifetree Software, Inc. has unveiled a bit-mapped word processor software package for scientific and academic applications, along with a version of its Volkswriter Deluxe word processor for the IBM 3270 Personal Computer.

Lifetree's Volkswriter Scientific features over 400 bit-mapped scientific and mathematical characters, multiple type styles and sizes, plus the Roman and Greek alphabets, the company said. Users reportedly can also create customized fonts and scientific symbols using individual pixels on a computer screen.

The software increases print quality of a dot matrix printer to typeset quality, because it drives each pin rather than employing the printer's native character set, Lifetree said. Volkswriter Scientific currently supports the IBM Graphics printer; the C. Itoh & Co., Ltd. Prowriter; the Epson America, Inc. RX-80 and FX-80; the NEC Information Systems, Inc. 8023; and the Toshiba, Ltd. 1350, the company said, with plans to support other models in the near future.

The package reportedly offers exact visual on-screen composition of text with formulas and symbols. It is designed for the IBM Personal Computer and compatible machines.

Priced at $495, Volkswriter Scientific is scheduled for shipment next month.

Volkswriter Deluxe will be offered for the IBM 3270 Personal Computer under Lifetree's corporate site-license program, the company said.

Lifetree is based at 411 Pacific St., Monterey, Calif. 93940.

World's Fastest Serial Printer

Line printer performance at half the cost

Up to 300 lpm throughput at 600 cps

Letter Quality/ Correspondence at 100/150 cps

High Density Graphics

Lowest cost per character

NCR
NCR is a Registered Service Mark

Florida Data Printers give you line printer throughput at well under line printer prices. They match line printer performance on many types of jobs. Throughput is optimized by Florida Data's patented stored energy printhead —*the world's fastest.*

The reliable automatic cut sheet feeder is an integral part of the printer—not an expensive add-on. The unique triple paper path also allows continuous forms and hand fed sheets. These printers are built to run 365 days a year. And nationwide NCR service is part of the package.

Call (305) 259-4700 or mail coupon for details

Florida Data Corporation
600D John Rodes Blvd.,
Melbourne, FL 32935

Send me information on your OSP printers.

NAME TITLE
COMPANY
ADDRESS
CITY, STATE, ZIP
TELEPHONE

FLORIDA DATA

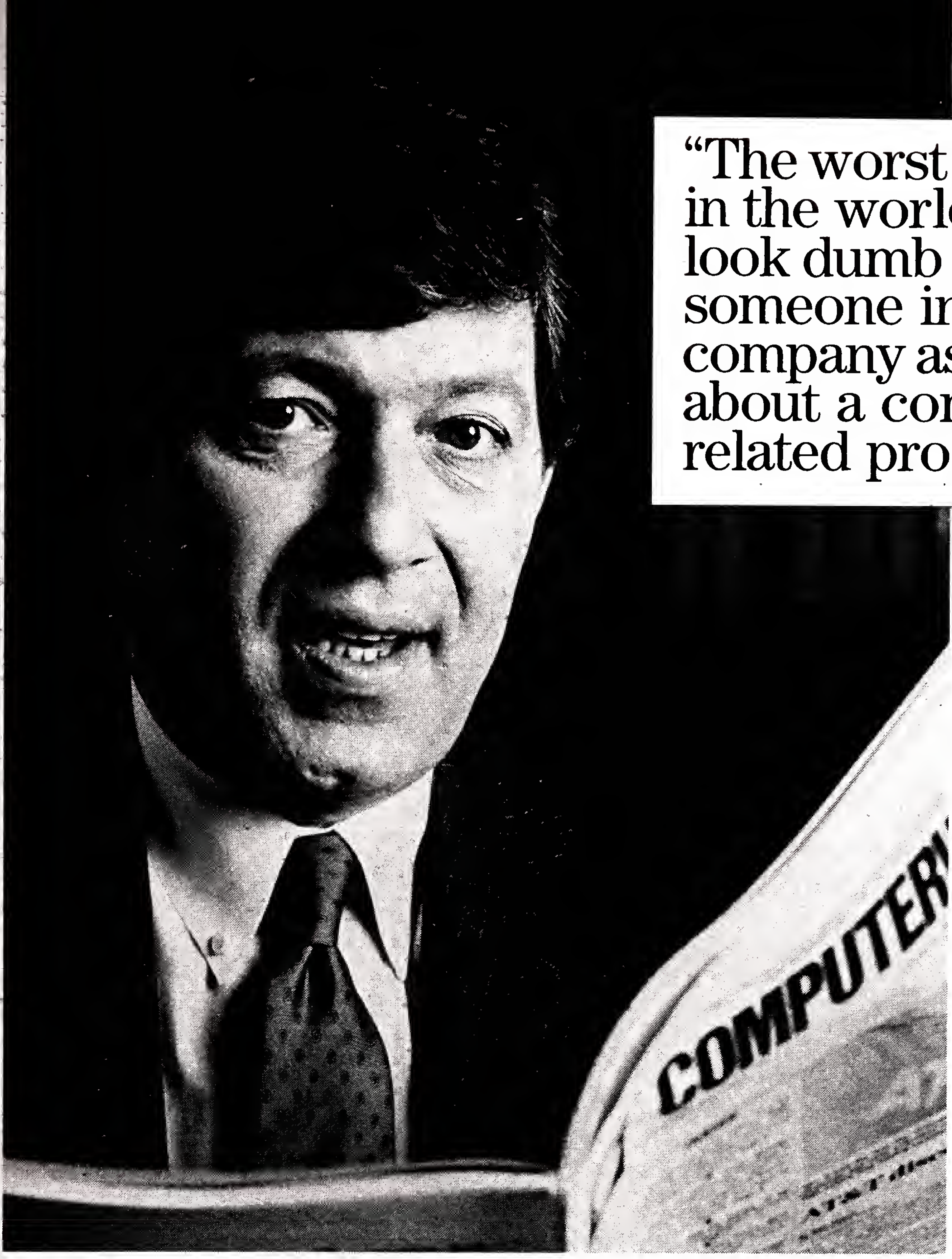
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

postage will be paid by

CIRCULATION DEPARTMENT
COMPUTERWORLD

375 Cochituate Road, Rte. 30
Box 897
Framingham, MA 01701-9985



"The worst thing in the world is to look dumb when someone in your company asks you about a computer related product..."

"... *Computerworld* puts you in touch with the experts and gives you up-to-the-minute exposure to the information you need to stay ahead."

That's what John Groppa—newly appointed director of MIS for the Stepan Company—told us when we asked him, "Why read *Computerworld*?" He's one of 125,000 paid subscribers who thinks that *Computerworld* is too important to his work to rely on someone else's copy.

Each issue of *Computerworld* brings you:

- **News.** You get absolutely up-to-the minute coverage on everything that affects you in the computer field.
- **Technical Information.** You'll find special sections on Software & Services, Communications, Systems & Peripherals, and Microcomputers. You'll read about the latest news and product information, user reports, and applications.
- **Editorial.** You'll gain opinions and insights from our editors, special columnists, and readers about topics of concern to you.
- **In Depth Features.** Several articles in each issue feature guest contributors who have expertise in a wide range of areas.
- **Computer Industry Update.** You'll hear the latest about the business of computers: the comings and goings of top executives ... who's making deals ... and who's making money!
- **Classified Advertising.** If it's available you'll see it advertised first in *Computerworld*! And, we devote our back section to position announcements, business opportunities, and a "bulletin board" for buying or selling used equipment.

Why should you subscribe to *Computerworld*?

☐ **It saves you time.** Headlines provide a capsule of the article so that you can get a quick overview of the week's news and announcements ... and come back to those articles of immediate concern.

☐ **It gives you a resource to return to.** Issue by issue *Computerworld* becomes a valuable addition to any business library—and the special issues become important references.

☐ **You keep up with new products.** Read a magazine for the ads? Absolutely! Software and computer vendors place ads first in *Computerworld* ... so you can get a fast look at what's available.

Who should read *Computerworld*?

Anyone *in* the computer world:

For the senior executive ... *Computerworld* keeps you on top with the latest breaking news.

For the mid-level executive ... *Computerworld* arms you with the facts you need to remain competitive on a day-to-day basis.

For the person just starting out in the computer business ... *Computerworld* provides an ongoing foundation of knowledge to help you move forward in your career.

For the non-computer executive ... *Computerworld* gives you the "must know" information in plain English and helps you with important management decisions.

Here's what you get with your subscription:

- You get 51 issues of *Computerworld*, the most vital newsweekly in the computer world today.
- You get special issues of *Computerworld On Communications*, which focus your attention on this fast growing area of computers today.
- You get 6 issues of *Computerworld OA*, which provide a full range of information about office automation, from proven training methods to applications software.
- You get 5 *Buyer's Guides*, which provide the details and contacts you need on every conceivable product ... from micros to mainframes.

And that's more than 12,300 pages filled with vital facts, important news, and invaluable reference material.

Order by phone ...
and save $5.00!

For faster service—and a special discount—dial our **toll-free** number today. You'll pay only $39.00 for one full year of *Computerworld*—that's $5.00 off our regular subscription price. Or, if you prefer, complete the order form you'll find bound into this issue.

1-800-343-5730
(In Massachusetts, call collect 617-879-0700.)

Get off the routing slip! Subscribe today.

THE *COMPUTERWORLD* GUARANTEE

If for any reason *Computerworld* does not live up to your expectations, simply notify us and we will refund the entire unused portion of your subscription price. No questions asked.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
375 Cochituate Road
Framingham, MA 01701

When you have to talk computers. Quote the experts.
Subscribe today! Call toll-free 1-800-343-5730.

ACT branch offers Apricot XI

SANTA CLARA, Calif. — ACT (North America) Inc., the U.S. subsidiary of the British firm, Applied Computer Techniques, has introduced the Apricot XI, a personal computer based on the Intel Corp. 8086 chip and incorporating a 3½-in. Winchester disk drive providing either 5M bytes or 10M bytes of storage.

The Apricot XI is said to feature 256K bytes of random-access memory (expandable to 768K bytes), a 3½-in. floppy disk drive, integral calculator and bundled software including Sorcim Corp.'s Supercalc and Superplanner. Three operating systems are standard: Microsoft, Inc.'s MS-DOS 2.0 and Digital Research, Inc.'s CP/M 86 and Concurrent CP/M 86, ACT said. The Apricot XI reportedly also includes the company's Manager menu-driven software.

The Apricot XI is priced at $3,995 for the 5M-byte version and $4,495 for the 10M-byte version without monitor. Adding the monitor, prices are $4,295 and $4,795, respectively. Shipments are expected to begin next month.

ACT also has announced two memory expansion boards for the Apricot and Apricot XI. A 128K-byte board is priced at $325, while a 256K-byte board costs $825.

ACT is located at 3375 Scott Blvd., Santa Clara, Calif. 95051.

Nomad2 version out for XT/370

WILTON, Conn. — D & B Computing Services has introduced a version of its Nomad2 fourth-generation language and data base management system for the IBM XT/370 microcomputer.

The application will give DP and MIS managers the ability to create a micro-to-mainframe link with the XT/370 and also permit nontechnical end users to access information from a centralized data base, said Eric Neikrug, director of Nomad2 development. "We feel we can go after both types of users," he maintained.

"Our mainframe version is sold mostly to information centers, and we see the XT/370 as a very good extension of that environment," Neikrug said.

Except for graphics, the XT/370 version of Nomad2 offers all the facilities of the mainframe version, including interactive procedural and nonprocedural language, financial modeling, statistical analysis and multilayered security, according to Neikrug. The firm is studying various graphics options.

"Performance in all cases is quite reasonable," he said. "It's amazing to see Nomad2 on a micro." He added that some screen-oriented tasks are performed quicker than on the mainframe because there are no terminal-to-host transmission delays.

Nomad2 will run on a standard XT/370 with 768K bytes of random-access memory, but adding another 512K bytes provides "a 300% improvement in throughput," Neikrug said.

The product is currently in beta test. Price for one to five copies is $10,000 (total), with each additional copy costing $1,000. Alternatively, an evaluation copy can be bought for $5,000, according to Neikrug.

D & B Computing Services is located at 187 Danbury Road, Wilton, Conn. 06897.

SOFTWARE

DIGITAL EQUIPMENT CORP.

Decmate II OS/278

Digital Equipment Corp. has introduced a new version of its OS/8 operating system designed for use with the Decmate II microcomputer.

Decmate II OS/278 reportedly enables programmers to develop application programs in Fortran IV, Basic and PAL8 assembly language. OS/278 enables the Decmate II to run a variety of programs originally developed for the Decmate I and earlier computer systems under OS/8 and OS/78 operating systems, according to the vendor.

OS/278 comprises a three-diskette set. The initial diskette contains the fundamental operating system; a second has the Basic and Fortran IV compilers and the third is the RD50/RD51 installation diskette, DEC said.

OS/278 is available for $74.

DEC, One Iron Way, Marlboro, Mass. 01752

APPLICATION EXECUTIVE CORP.

APX Core Executive

Application Executive Corp. has announced APX Core Executive, which is said to allow concurrent processing of up to eight tasks on the IBM Personal Computer.

With APX Core Executive, a user can integrate off-the-shelf applications not designed to be integrated without modification, the vendor said.

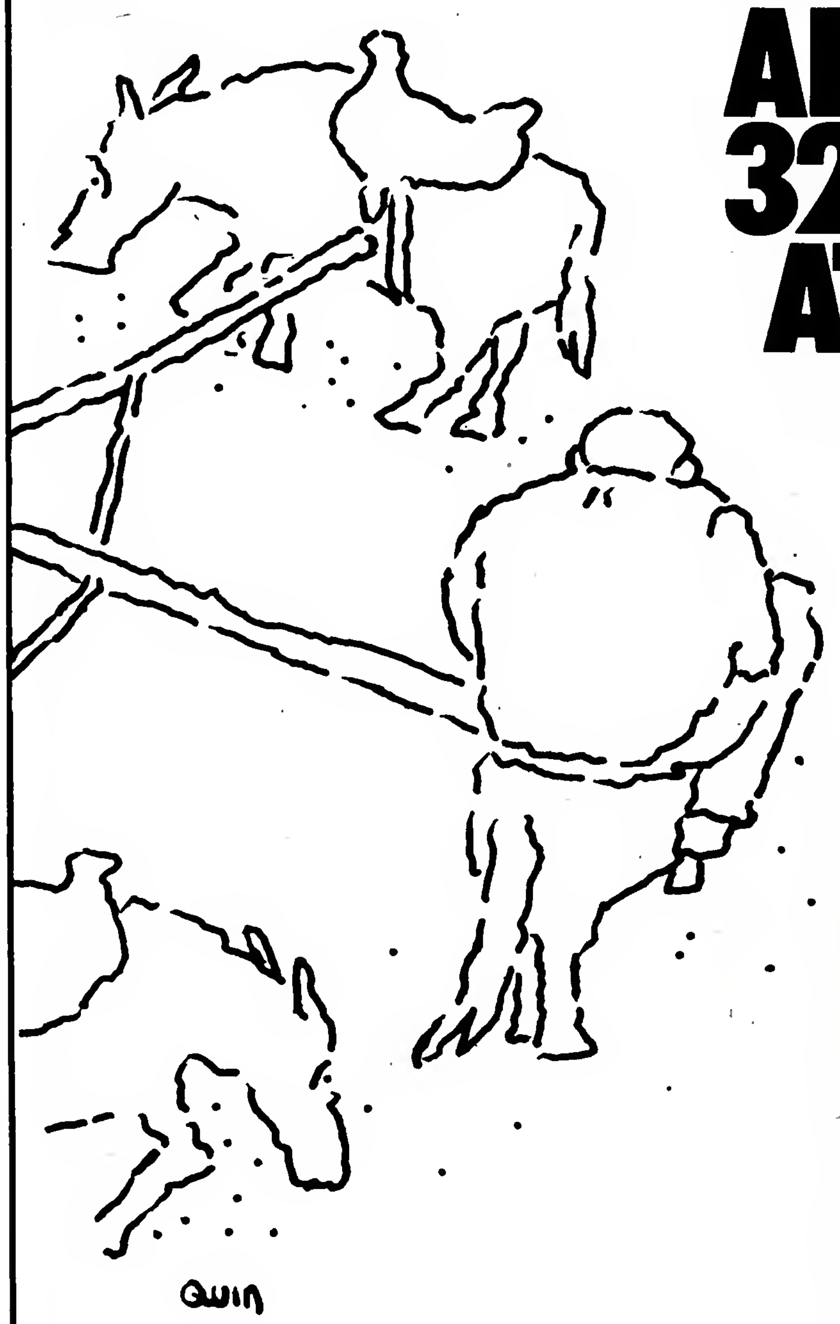
Other features of the software are windowing, a macro keystroke facility and ability to transfer blocks of data between programs, according to Application Executive.

The software costs $195, but will be available until July 15 for $95.

Application Executive, Suite 4C, 600 Brodway, New York, N.Y. 10012.

See SOFT page 131

ANOTHER IBM 3274/76 USER AT THE REINS.



SORT OF.

The alternatives in printers for the IBM 3274/76 user could be categorized, basically, into two separate areas:

Take it, or leave it.

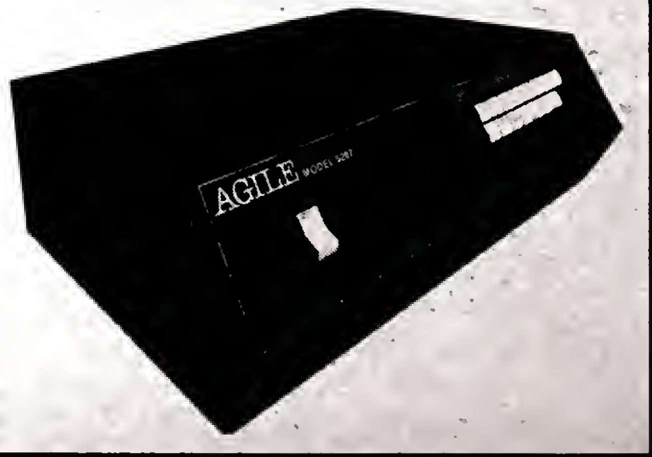
The AGILE 5287 Printer Protocol Converter allows you the intelligent alternative of a printer to suit your specific application. The flexibility to choose high speed printers, plotters, dot matrix, daisy wheel or even laser printers, provides you with the system control you intended. Pass the word; you're back in command.

Installation of the AGILE 5287 is simple. Its industry proven reliability, achieved through the 5287's built-in diagnostics, is backed by a full one-year warranty and a 30-day money back guarantee.

The AGILE 5287—call us for all the information necessary to make the choice.

After all, nobody likes to be taken for a ride.

PRINTER PROTOCOL CONVERTER



AGILE

4041 Pike Lane, Concord, California 94520
(415) 825-9220 • Outside California (800) 538-1634

SOFT from page 130

COMPUPRO CORP.
Concurrent DOS 8-16

Compupro Corp. has announced its own version of Digital Research, Inc.'s Concurrent DOS operating system that will be bundled with selected models of the company's System 816 Series of IEEE 696/S-100 bus microcomputers.

Called Concurrent DOS 8-16, the new operating system reportedly permits simultaneous 8- and 16-bit operation, while adding a PC-DOS 1.1 compatibility mode, DRNET and GSX support as released by Digital Research, Inc., plus Microcall Services' Amcall modem software.

The operating system also supports Intel Corp.'s 8087 math coprocessor for high-performance arithmetic operations, as well as Compupro's MDrive/H solid state disk emulator, the company said.

Current users of the System 816 Models B, C, D and F running the MP/M 8-16 operating system can purchase the upgraded system for $150, the vendor said. System 816 users lacking MP/M 8-16 can obtain Concurrent DOS 8-16 for $400.

The product will be available in July.

Compupro, 3506 Breakwater Court, Hayward, Calif. 94545.

PHASER SYSTEMS, INC.
SPF/editor

Phaser Systems, Inc. has announced SPF/editor for microcomputer users, aimed at reducing editing time for users working on the IBM Personal Computer, IBM Personal Computer XT and board-compatible machines.

SPF/editor emulates the IBM mainframe ISPF editor, according to the vendor. The product offers full-screen panels and full DOS 2.0 Path Support, which allows users to edit files in any directory as well as execute from any Path Directory, Phaser said.

SPF/editor is priced at $100.

Phaser Systems, 24 California St., San Francisco, Calif. 94111.

COMMUNICATIONS

NEW ERA TECHNOLOGIES, INC.
Mighty Mail

New Era Technologies, Inc. has announced Mighty Mail, a communications program for the IBM Personal Computer.

Mighty Mail allows single-keystroke calling of electronic mail and information systems, according to the vendor. The program is said to allow users to send and receive files automatically from other programs, switch networks when errors occur or networks are down and stamp incoming electronic mail with time and date information. Mighty Mail also features mail sorting, file management and password protection, according to the vendor.

The software requires 256K bytes of random-access memory; two double-sided, double-density disk drives; and a Hayes Microcomputer Products, Inc. Smartmodem 1200 or 1200B.

Mighty Mail costs $349.

New Era Technologies, Suite 924, 2023 Eye St. N.W., Washington, D.C. 20006.

HARRIS CORP.
Harris Connection; PC Integrator

Harris Corp. has introduced Harris Connection and PC Integrator, interface products that allow IBM Personal Computers and Personal Computer XTs to be used as distributed data processing workstations with Harris superminicomputers.

Harris Connection allows the IBM Personal Computer to emulate a Harris terminal and perform formatted data entry, on-line text editing and program development, Harris said. The Personal Computer reportedly can communicate in Binary Synchronous Communications and Systems Network Architecture protocols in local and remote modes.

PC Integrator connects IBM Personal Computers to peripheral devices such as high-speed printers.

Harris Connection costs $1,500, and PC Integrator sells for $80.

Harris, Information Terminals Group, P.O. Box 400010, 16001 Dallas Pkwy., Dallas, Texas 75240.

NOT JUST ANOTHER
3274 LOOK-ALIKE . . .

Frankly, our CCI 8274C is better. For over 17 years we have improved upon industry standards . . . **innovation,** not imitation, has been our trademark. The CCI 8274C Remote Cluster Group offers unique features and benefits derived from our years of communications experience and commitment to technological innovation.

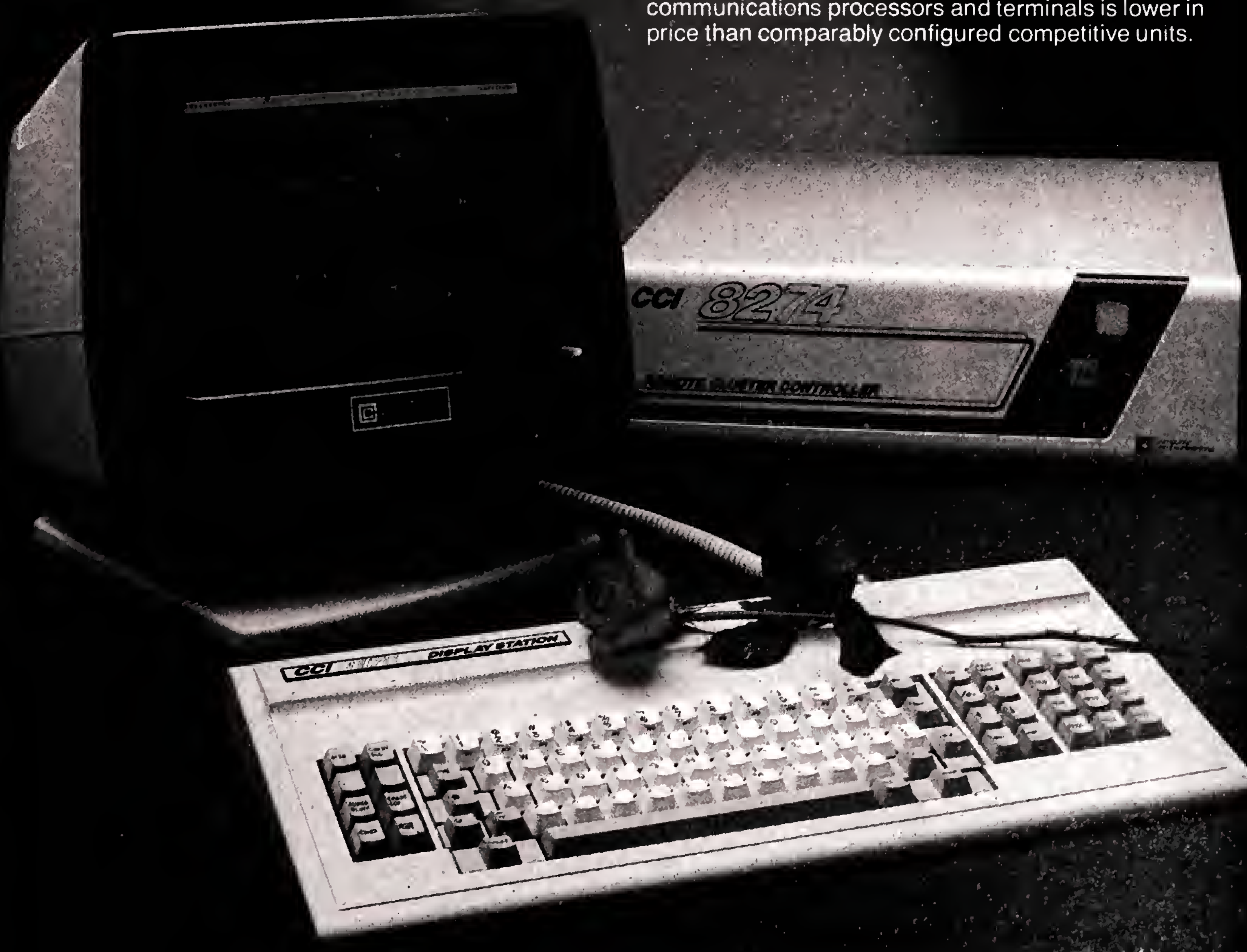
Consider the following advantages:

- Support for up to **40** enhanced, 3178-type displays via **coaxial connection.**
- The CCI 8178 Display Station is a higher performance, block mode replacement for the 3178

Enhancements include a keyboard-selectable **26th** status line with Cursor row/column indicator, Time of Day, and Security keylock password protection, and more . . .

- Up to **90%** savings in coaxial cable and associated cable-run charges with the use of CCI's CABLETALK™ multiplexing protocol.
- Concurrent ASCII to SDLC protocol conversion for ASCII CRTs and their **Personal Computer** (PC) emulators.
- Local copy plus an exclusive "**private**" printer mode.

And yet, this newest addition to the CCI family of communications processors and terminals is lower in price than comparably configured competitive units.



CCI — THE INTELLIGENT ALTERNATIVE.

Doesn't it make sense to go with an experienced, technology leader? Contact . . .

Computer Communications, Inc.
2610 Columbia Street, Torrance, CA 90503 • (800) 421-1178 • (213) 320-9101

COMM

from page 131

TOUCHSTONE SOFTWARE CORP.

PCworks for 3B2

Touchstone Software Corp. has introduced PCworks software for the AT&T 3B2 microcomputer. PCworks will complement AT&T's PC Interface software, allowing the attachment of IBM-compatible personal computers to AT&T's multiuser 3B2 running the Unix operating system, according to the vendor.

Running on the 3B2, PCworks uses RS-232 asynchronous communications lines to hook up to personal computers, according to Touchstone. PCworks programs using Microsoft, Inc.'s MS-DOS operating system are also available, according to the.vendor.

The PCworks program is priced at $495, according to the vendor.

Touchstone Software, Suite 207, 909 Electric Ave., Seal Beach, Calif. 90740.

AURA

from page 127

cluded in spreadsheets, graphs or word processing documents.

Aura can create and link multiple spreadsheets, limited only by system disk capacity, the company claimed. A zoom feature produces a three-dimensional view, permitting users to view and change related data in a linked spreadsheet, Softrend said.

The word processor reportedly can handle data base information, spreadsheets or graphs and can edit several files concurrently. The graphics package offers free-draw graphics and the ability to alter prepared graphics dynamically and automatically, the company said. On-line help is said to be available throughout the program.

Last week Softrend also announced Aura Comm, an optional menu-driven communications software package designed to work with the firm's integrated software package. Aura Comm supports asynchronous communications with several terminal emulation capabilities, including Digital Equipment Corp. VT100 and VT52 and IBM 3270, the company said.

Additional features reportedly include unattended file transfer; compatibility with most popular autodial modems and asynchronous boards; bidirectional file transfer with data compression, encryption, error checking and password protection; the ability to run another program while transferring data; the ability to send, receive and print simultaneously; and automatic access to seven public data base networks.

Integrated with Aura, the product allows the micro to dial up to 32 remote computers automatically on a given schedule and transfer information, Wetherell said. Priced at $150, Aura Comm will be available by October.

To handle customer calls, Softrend has established a marketing support system, developed by Software Professionals Corp. of Salem, N.H., which combines a central IBM System/36 with multiple IBM Personal Computer XTs.

The Personal Computer XTs act as terminals on the System/36 for call and inquiry processing and other functions, and the System/36 generates batch reports that analyze calls to the company, said John Oullet, Software Professionals senior consultant.

Additionally, the Personal Computer XTs store and run Aura copies, which permit marketing support representatives analyzing customer problems to follow the customer's steps through the program to isolate difficulties, according to a Softrend spokesman.

Aura's minimum system requirements includes 256K bytes of random-access memory with either two floppy disk drives or one floppy disk drive and a hard disk drive.

Softrend will sell site licenses for firms requiring over 500 copies, Wetherell said.

Softrend is located at 2 Manor Pkwy., Salem, N.H. 03079.

“HUNDREDS OF
DIFFERENT OPERATIN

“R:BASE™ KEEPS ME ON TOP OF THE WORLD'S BIGGEST BUSINESS.”

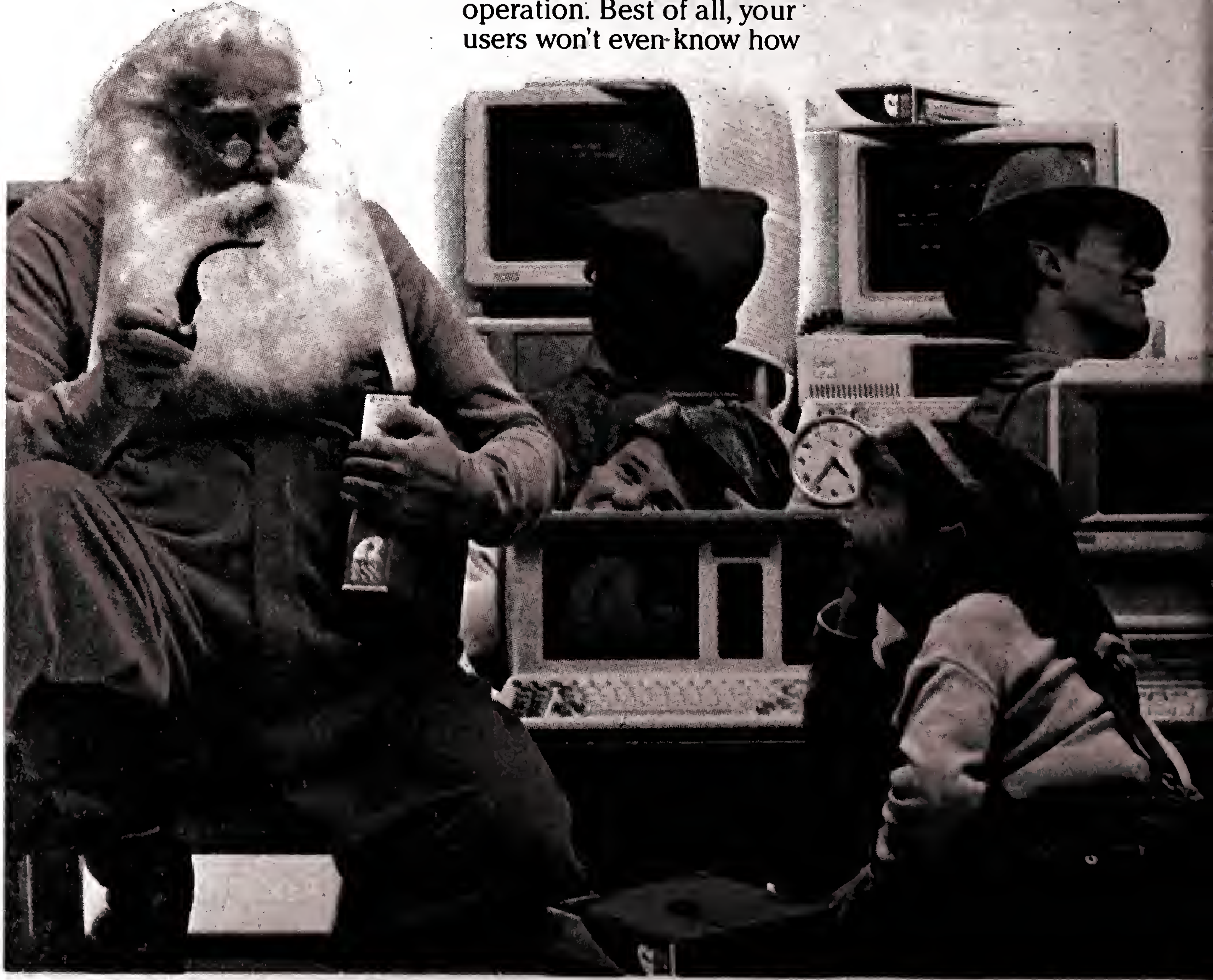
Now there's a brand new way to make sense out of all the micros in your company. Glue them together with the world's most complete family of DBMS software. R:BASE.™

This high-performance software comes in a whole range of versions. In MS™-DOS, PC/DOS,™ CP/M,® BTOS™ and CTOS.™ For multiuser or stand-alone applications, and even for personal use. So you can literally grab every one of those expensive little machines by the database. And standardize your data acquisition and information management practices.

Of course, data and file structures used on one type machine are completely compatible with any of the others. It's the end of jargon as you know it. The beginning of a totally buttoned-up, cost-efficient operation. Best of all, your users won't even know how tight the control is. They'll just think they're having the time of their lives playing with the computer.

“A PROGRAM YOUR PEOPLE CAN RELATE TO.”

Now, there's a brand new option that makes R:BASE a lot easier to relate to. R:BASE CLOUT™ (Conversational Language Option). It lets everyone communicate with a microcomputer in plain English. It even remem-



MULTI from page 127

suppliers acknowledged. Because Microsoft has not released or publicly scheduled a multiuser version of MS-DOS, hardware manufacturers have turned to other sources for operating software that can run multiple MS-DOS applications, and they have come up with a variety of hardware/software configurations.

North Star, which began shipping Dimension in volume in April, is the first significant player to offer a Personal Computer-compatible multiuser machine, according to Ahuja. The company chose to offer a "network in a box" with a proprietary operating system, an Intel Corp. 80186 server processor and IBM-compatible bus, he noted. Each slot on the bus can be filled with an Intel 8088 processor board with 128K bytes of random-access memory (RAM), and these boards handle single-user MS-DOS applications. Several other vendors such as Alloy Computer Products, Inc. in Framingham, Mass., have taken a similar design approach.

At Comdex/Spring, Televideo Systems, Inc. in Sunnyvale, Calif., introduced the Personal Mini, another multiuser IBM Personal Computer-compatible system, designed to take advantage of existing Personal Computers. The Personal Mini combines a desktop host with an Intel 80186 CPU and a Zilog, Inc. Z80 I/O processor, a proprietary multiuser operating system and up to 16 workstations. The workstations can be either IBM Personal Computers, compatible microcomputers or compatible diskless workstations.

Offered with a starting price of $8,995 for the host, the system offers IBM Personal Computer XT users the ability to expand from a single-user environment to a multiuser environment with the capability to run minicomputer applications, said Frank Zurcher, executive vice-president and general manager, Computer Systems Division.

Many other firms plan to sell multiuser systems running Concurrent DOS, a multitasking operating system that runs most off-the-shelf IBM PC-DOS and Digital Research, Inc. CP/M 86 applications. It is being offered by Digital Research in Pacific Grove, Calif.

Digital Research itself heads the list with Starlink, a hardware/software package designed to upgrade an IBM Personal Computer XT into a multiuser system that supports up to four terminals, modems or micros. On display for the first time at Comdex/Spring, Starlink includes Digital Research's operating system and plug-in board with an Intel 8088 processor, 64K bytes of RAM and four serial ports.

Priced at $1,695, Starlink provides a low-cost way to share desktop computing resources among "periodic workers," said Digital Research President John Rowley. In large corporations, many employees need micros full time for applications such as word processing, but these people are often surrounded by clusters of other workers who need access only occasionally and cannot justify acquisition costs for their own personal computers, he pointed out.

In the least advantageous case, a Starlink setup will cost half as much as buying personal computers, Rowley maintained. He added that corporations that currently have spare dumb terminals can put these devices back to work with Starlink.

Walk, not run to nets

Starlink also saves on software costs by allowing multiple users to use an application at the same time, Digital Research said. In addition, the company said that the setup permits users "to walk rather than run" to local-area networks, as the host can operate on a net.

"At this show, really for the first time, we're seeing multiple vendors selling the [Personal Computer] as a multiuser system," commented Amy Wohl, president of Advanced Office Concepts Corp. in Bala Cynwyd, Pa. "The most promising, from the market viewpoint, is [Digital Research]."

However, Wohl was among those pointing to Starlink's limitations, saying that the system appeared slow. "The IBM Personal Computer was designed specifically as a personal computer," she noted. "Multiuser [operation] stretches the 8088 beyond its useful capability."

ITTLE MICROS.
SYSTEMS. HO! HO! HO!"

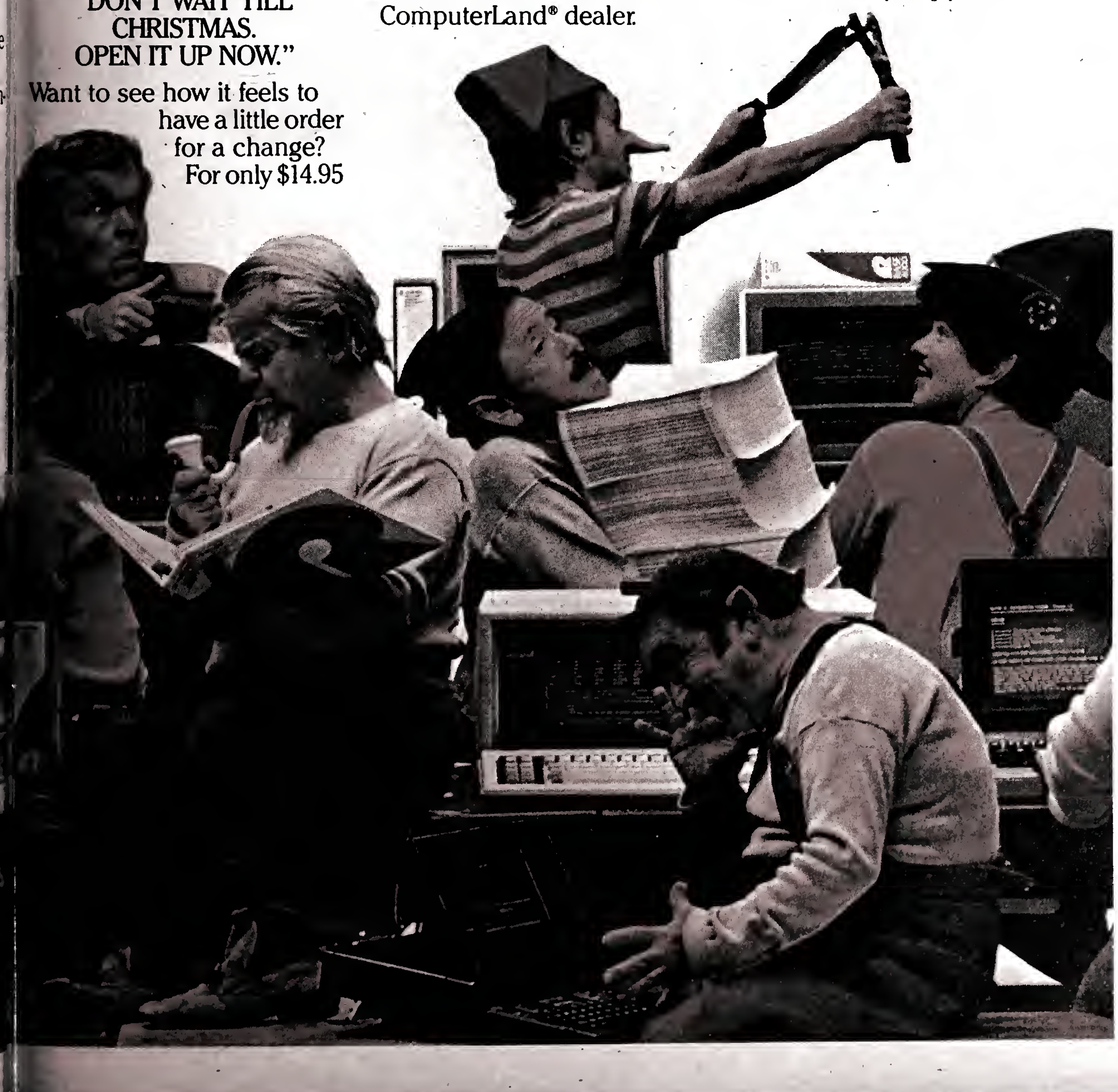
bers an individual user's favorite abbreviations and slang. In fact, this is nothing less than an artificial intelligence system that actually learns from experience. And when you put it together with all the power of R:BASE, you've got a package that just can't be beat.

"DON'T WAIT TILL CHRISTMAS. OPEN IT UP NOW."

Want to see how it feels to have a little order for a change? For only $14.95 (plus shipping) we'll send you a comprehensive demonstration packet* of R:BASE and R:BASE CLOUT DBMS software, including three separate diskettes. Just call 1-800-547-4000, Dept. 844. In Oregon, or outside the U.S., call 1-503-684-3000, Dept. 844. Or ask for it at your nearest software store or ComputerLand® dealer.

R:BASE™
FROM MICRORIM®

*Requires 256K of memory. Runs on MS™-DOS and PC/DOS operating systems.



MICROCOMPUTERS

SYSTEMS

MULTITECH INDUSTRIAL CORP.
MPF-PC/XT

Multitech Industrial Corp. has announced an IBM Personal Computer-compatible microcomputer that features an integrated 10M-byte fixed disk drive.

The 16-bit MPF-PC/XT also comes with a 360K-byte floppy disk drive and a standard 128K bytes of random-access memory (expandable to 256K bytes), dual serial communication ports and one parallel port.

The unit operates on Microsoft, Inc.'s MS-DOS 2.0 operating system. It is priced at $3,995.

Multitech Industrial, 315 Fu Hsing N. Road, Taipei 104 Taiwan.

STORAGE

DURANGO SYSTEMS, INC.
Storage options for Poppy, Poppy II

Durango Systems, Inc. has announced two storage options for its Poppy and Poppy II business systems.

One option is a 40M-byte hard disk storage system, which reportedly features a 5¼-in. disk, an average access time of 30 msec and a transfer rate of 625K byte/sec.

The second option is a digital cassette tape backup designed for unattended operation and storing 20M bytes of formatted data, Durango said. According to the company, the 20M bytes can be offloaded in about 12 minutes.

The hard disk option will be available during the third quarter of 1984 for $4,279. The tape backup will be available during the fourth quarter for $1,965.

Durango Systems, 3003 N. First St., San Jose, Calif. 95134.

EMULEX CORP.
Javelin

Emulex Corp. has announced the Javelin, a Small Computer Systems Interface desktop mass-storage subsystem, which connects to a wide variety of CPUs through an independent host adapter.

The Javelin connects to the Digital Equipment Corp. Q-bus and Unibus, the Intel Corp. Multibus and the IBM Personal Computer, Personal Computer XT and compatible microcomputers, Emulex said.

Javelin storage options reportedly include either two 5¼-in. Winchester disk drives, or one disk drive and one ¼-in. streaming-cartridge tape drive for backup storage. Each Winchester disk can range in capacity from 46M to 140M bytes, according to the vendor.

The Emulex Javelin model ED2/70-T includes an 86M-byte, 5¼-in. Winchester disk drive packaged with a ¼-in. streaming-cartridge tape drive. Unit price is $7,725, and the product is scheduled for August delivery.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

BOARD-LEVEL DEVICES

QUADRAM CORP.
Quad3278

Quadram Corp. has announced Quad3278, a board that plugs into an IBM Personal Computer to allow access to IBM mainframe computers located either in the same office or in remote locations.

The Quad3278 software and hardware package allows an IBM Personal Computer, Personal Computer XT or compatible computers to communicate with an IBM mainframe via a 3270 coaxial network, according to the vendor.

Quad3278 allows the user to retrieve, store and print pages of information from the mainframe computer, the vendor said.

The price for Quad3278 is $1,195, including the interface card, user manual and software, the vendor said. A starter kit, including 100 feet of coaxial cable, costs $95, the company added.

Quadram, 4355 International Blvd., Norcross, Ga. 30093.

ARNET SYSTEMS, INC.
TR-4

Arnet Systems, Inc. has announced the TR-4 anti-theft board, a plug-in printed-circuit board for the IBM Personal Computer and compatible systems, designed to prevent theft or piracy of software.

The anti-theft board has four RS-232 serial ports and a battery-operated calendar/clock, Arnet said. The board reportedly contains programmable array logic devices that require the software to be protected to send a code sequence to the TR-4 board, which will respond with a sequence known to the manufacturer.

The board is priced at $750.

Arnet Systems, 1717 W. End Ave., Nashville, Tenn. 37203.

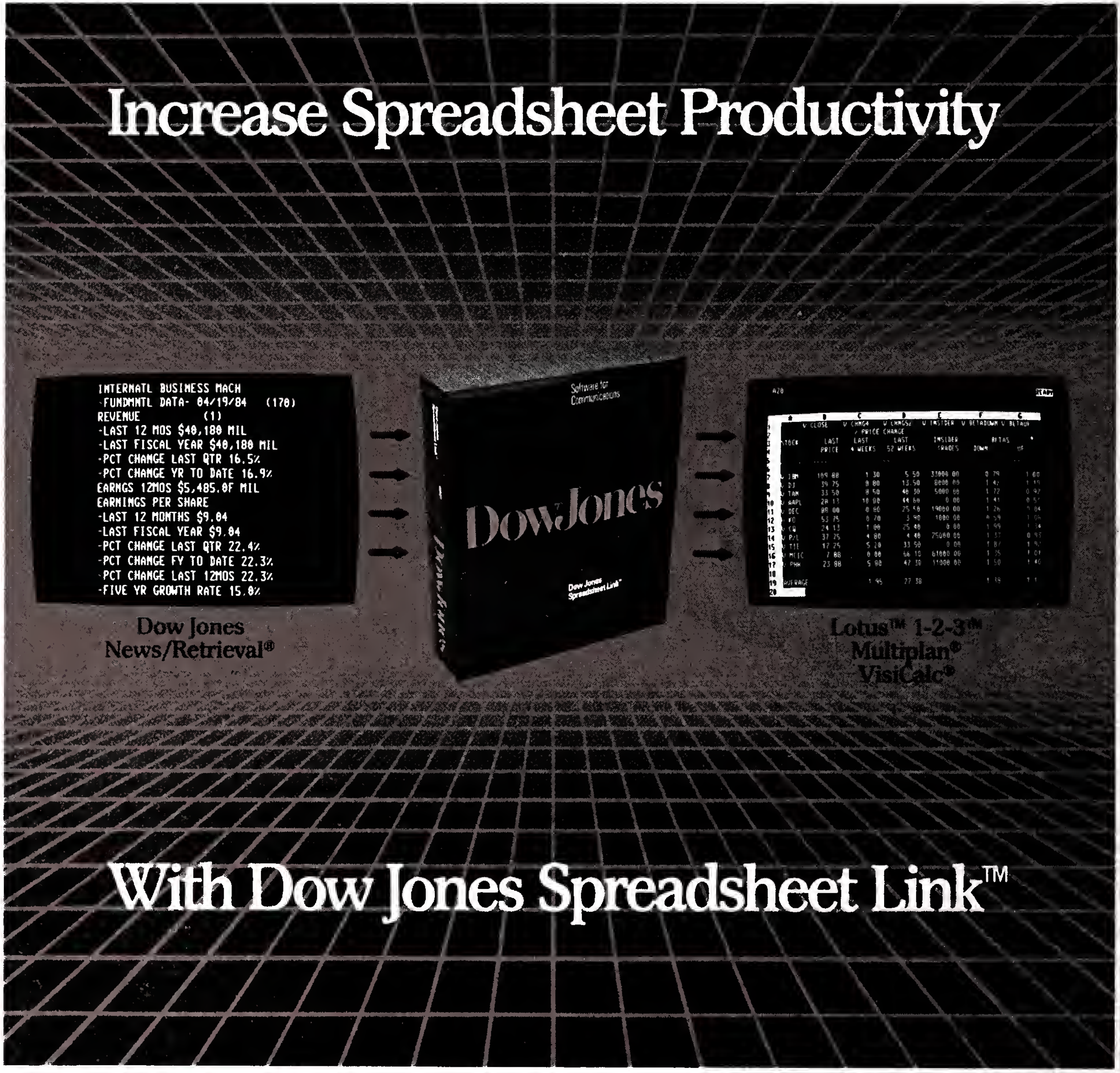
AUXILIARY EQUIPMENT

CSD, INC.
Ultra-Res controller line

CSD, Inc. has introduced its Ultra-Res line of high-resolution monochrome and color graphics controllers for IBM Personal Computers.

The Ultra-Res controllers are said to offer 262,144 pixels of monochrome or up to 1 million pixels of color resolution that can be vertically and horizontally organized. The controllers are priced from $495 to $995.

CSD, P.O. Box 253, Sudbury, Mass. 01776.


Increase Spreadsheet Productivity
INTERNATL BUSINESS MACH
-FUNDMNTL DATA- 04/19/84 (170)
REVENUE (1)
-LAST 12 MOS $40,180 MIL
-LAST FISCAL YEAR $40,180 MIL
-PCT CHANGE LAST QTR 16.5%
-PCT CHANGE YR TO DATE 16.9%
EARNGS 12MOS $5,485.0F MIL
EARNINGS PER SHARE
-LAST 12 MONTHS $9.04
-LAST FISCAL YEAR $9.04
-PCT CHANGE LAST QTR 22.4%
-PCT CHANGE FY TO DATE 22.3%
-PCT CHANGE LAST 12MOS 22.3%
-FIVE YR GROWTH RATE 15.0%
Dow Jones News/Retrieval®
Software for Communications
Dow Jones
Dow Jones Spreadsheet Link
Lotus™ 1-2-3™
Multiplan®
VisiCalc®
With Dow Jones Spreadsheet Link™

Approved for the IBM® 3270 PC.

Dow Jones Spreadsheet Link is the first information retrieval product approved by IBM for use on the IBM 3270 Personal Computer. Also available for the IBM® PC, IBM® XT, and Apple® II systems.

From the Publisher of The Wall Street Journal.

For over 100 years, Dow Jones has been the most respected name in business information and a leader in communications technology. Now that same reliability and professionalism are available in leading edge software for business applications.

Flexible Applications, Easy to Use.

Spreadsheet Link is an invaluable decision support tool for spreadsheet users at all levels of your company. It allows the user to quickly retrieve important data and download it into customized spreadsheet templates for all kinds of business analysis. No time-consuming research, no manual data entry.

Fully Supported.

Spreadsheet Link is backed by a 60-day warranty, thorough documentation and a toll-free customer service hotline available six days a week. If you or anyone in your organization has a question concerning Spreadsheet Link, you'll get the attention you need to solve your problem.

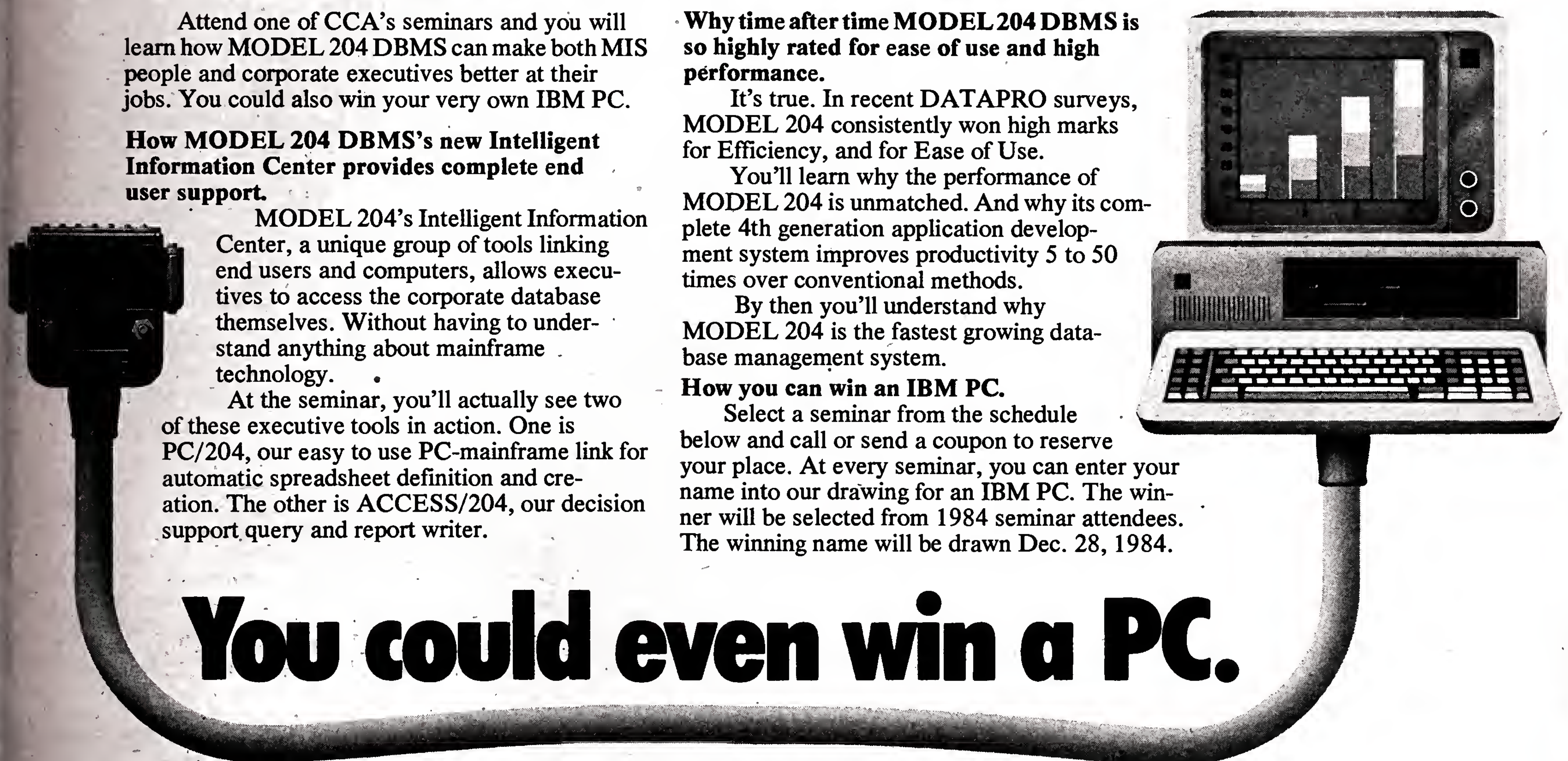
Connection to the #1 Information Service.

Spreadsheet Link provides immediate access to financial data from Dow Jones News/Retrieval,® the nation's leading online information service. At your fingertips are earnings forecasts, SEC filings and up-to-date information on companies and industries, current and historical stock market quotes, and exclusive news from the Dow Jones News Service and The Wall Street Journal.

For a free brochure and information about our Special Corporate Offer, call Jon Rock at:
1-609-452-2000 ext. 2668

By Solutions, Inc. and Dow Jones & Company, Inc.
Copyright © 1984 Dow Jones & Company, Inc. All Rights Reserved.

At CCA's seminar you'll learn about the Intelligent Information Center™ and the newest DBMS tools, like PC-mainframe links.



Attend one of CCA's seminars and you will learn how MODEL 204 DBMS can make both MIS people and corporate executives better at their jobs. You could also win your very own IBM PC.

How MODEL 204 DBMS's new Intelligent Information Center provides complete end user support.

MODEL 204's Intelligent Information Center, a unique group of tools linking end users and computers, allows executives to access the corporate database themselves. Without having to understand anything about mainframe technology.

At the seminar, you'll actually see two of these executive tools in action. One is PC/204, our easy to use PC-mainframe link for automatic spreadsheet definition and creation. The other is ACCESS/204, our decision support query and report writer.

Why time after time MODEL 204 DBMS is so highly rated for ease of use and high performance.

It's true. In recent DATAPRO surveys, MODEL 204 consistently won high marks for Efficiency, and for Ease of Use.

You'll learn why the performance of MODEL 204 is unmatched. And why its complete 4th generation application development system improves productivity 5 to 50 times over conventional methods.

By then you'll understand why MODEL 204 is the fastest growing database management system.

How you can win an IBM PC.

Select a seminar from the schedule below and call or send a coupon to reserve your place. At every seminar, you can enter your name into our drawing for an IBM PC. The winner will be selected from 1984 seminar attendees. The winning name will be drawn Dec. 28, 1984.

You could even win a PC.

CCA's Executive DBMS Seminar Schedule

June				**July**	
Albuquerque	June 14	Philadelphia	June 5	Dallas	July 10
Boston	June 14	Pittsburgh	June 19	Oakland	July 12
Buffalo	June 5	Oklahoma City	June 7	Portland, OR	July 26
Chicago	June 14	Omaha	June 7	San Francisco	July 25
Denver	June 21	Rochester	June 28	St. Louis	July 12
Hartford	June 21	Saddle Brook, NJ	June 28	**August**	
Nashville	June 5	Syracuse	June 27	Houston	Aug. 21
New York	June 21	Washington D.C.	June 12	Los Angeles	Aug. 30
				Minneapolis	Aug. 28
				San Mateo	Aug. 28

Representatives: Canada, U.K., Europe, Australia, Japan, Saudi Arabia.
In Canada, contact Polaris Computer Systems Ltd., Toronto.

Intelligent Information Center is a trademark of Computer Corporation of America.

Computer Corporation of America

( ) Yes, I'm interested, I'd like to attend. Please call me with details.
( ) I can't attend right now. Please send me information on MODEL 204.

NAME ____________________ TITLE ____________________
COMPANY ____________________
ADDRESS ____________________
CITY ____________________
STATE ____________________ ZIP ____________________
TELEPHONE ____________________

Operating System: ( ) MVS ( ) DOS ( ) CMS ( ) Other: __________

Computer Corporation of America, A Crowntek Company
Four Cambridge Center, Cambridge, MA 02142 (617) 492-8860

CW6/11S

PRINTERS/PLOTTERS/ PERIPHERALS

DIGITAL EQUIPMENT CORP.
LA100-PF

Digital Equipment Corp. has introduced a multimode printer reportedly capable of emulating the three printers commonly used with the IBM Personal Computer.

The LA100-PF can selectively emulate the IBM Graphics Printer and IBM Matrix Printer and Epson America, Inc.'s MX80 printer. It is also fully compatible with DEC's line of microcomputers, according to the vendor.

The printer reportedly features a draft-mode speed of 240 char./sec, a wide paper carriage to accommodate 132-col. printing without character compression and the ability to switch from draft to near-letter-quality print mode without changing software. The user also can change from various font styles without changing software files, the vendor said.

The LA100-PF costs $1,595. A parallel interface is available for $95, and font cartridges cost $125 each.

DEC, 146 Main St., Maynard, Mass. 01754

QUADRAM CORP.
Amberchrome

Quadram Corp. has announced Amberchrome, a monochrome monitor that is said to make characters on IBM Personal Computer monitors appear more clear and sharply focused.

Amberchrome plugs directly into the IBM Monochrome Display adapter and produces a resolution of 720 dots by 350 lines, using a 7- by 8-dot character in a 9- by 14-dot matrix, according to the vendor.

Amberchrome is priced at $250.

Quadram, 4355 International Blvd., Norcross, Ga. 30093

STAR MICRONICS, INC.
PC Printers

Star Micronics, Inc. has announced IBM Personal Computer-compatible dot matrix impact printers called PC Printers, which will also print for IBM-compatible microcomputers.

PC Printers will be added to Star's Gemini, Delta and Radix printer lines, with both 10- and 15-in. versions.

Star's Gemini-10X PC printer is priced at $399; its Gemini-15X PC printer, at $549. The firm's Delta-10 PC printer costs $549; its Delta-15 PC printer costs $799. Star's Radix-10 PC printer is priced at $849; its Radix-15 PC printer, at $995, according to the vendor.

Star Micronics, 200 Park Ave., N.Y., N.Y. 10166

SAKATA U.S.A. CORP.
SA-1000

Sakata U.S.A. Corp. has announced the Model SA-1000 CRT display amber monitor, with a 12-in.-high resolution, amber type, nonglare high-contrast and dark faceplate.

Features include composite video input signal, scanning frequency of 15.75 kHz horizontal and 60 kHz vertical, a 900- by 800-pixel resolution, and a 2,000-char. display format.

The monitor is said to be compatible with most micros, including IBM, Apple Computer, Inc. and Commodore Business Machines, Inc.

The monitor costs $159.

Sakata U.S.A., 651 Bonnie Lane, Elk Grove Village, Ill. 60007.

COMDEX from page 127

As expected, both Framework and Symphony drew crowds. Many showgoers commented that both programs will carve out substantial sales, adding that Symphony looks more powerful but harder to use.

■ Pushing the state of the art in applications packages such as these or in system software requires very substantial development commitments, said Digital Research, Inc. President John Rowley. Digital Research has assigned 34 people to the development team for one unannounced product, he said. "The implementation is at least as complicated as it is for a minicomputer operating system."

■ Software developers also eagerly await hardware built around the next generation of Intel Corp. chips, because new packages are pushing the Intel 8088 chip to its limits or a little beyond.

■ With competition springing up all around, dealers seemed to be running a little scared and to be examining new products more critically than they did at last year's show — probably good news for most customers.

LINKS from page 127

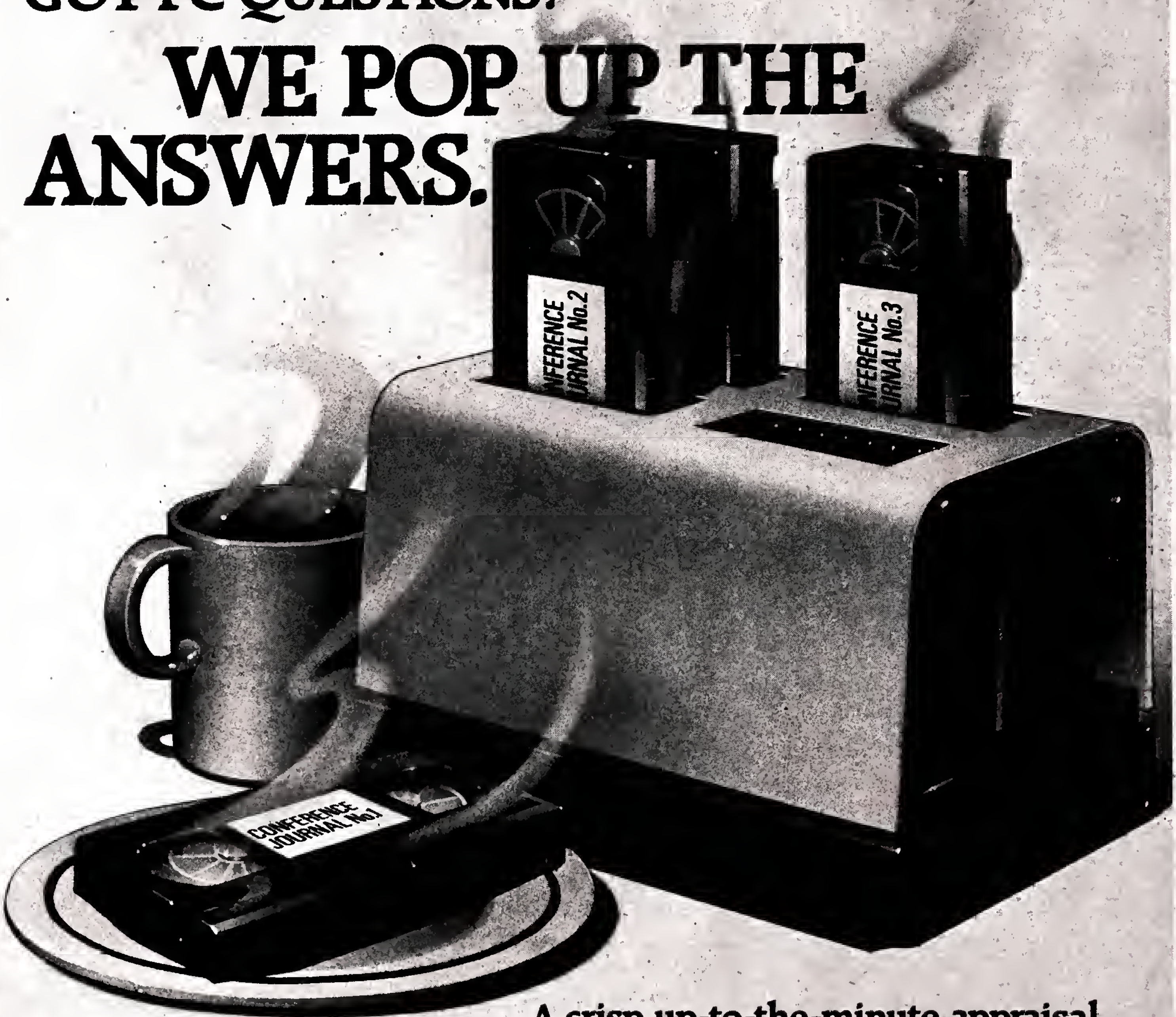
Accessing third-party data bases is easy, according to Broweleit. "Almost all communications packages can tie your personal computer to third-party data bases," he claimed.

By moving software applications processing from the mainframe to the personal computer level, personal computers can ease the mainframe processing load, he said.

Bridges to exchange microcomputer and mainframe data are available, according to Broweleit. Managers should select only those packages that merge and export records in standard data formats such as Data Interchange Format and Ascii, he recommended.

When selecting industry-standard equipment, allegiance to one vendor is a profitable strategy, Broweleit said. "When a company offers more than one standard, the MIS manager's job selecting products is that much easier."

GOT PC QUESTIONS?
WE POP UP THE ANSWERS.



A crisp, up-to-the-minute appraisal of the personal computing industry, that you can consume in just minutes.

Personal computing is changing so much, so fast that what was true just two years ago is already outdated. Word processing, data base software, integrated software packages–how do you stay on top of it all?

DELTAK and CW Communications have the answers in "Personal Computing: A Business Update," four 30-minute Conference Journal cassettes, videotaped on location at the PC World Expo in Houston. These programs bring you the latest information on the fastest growing industry in history.

In Part 1 of this series, well-known industry experts look at the state of the industry: where it's going, what new demands it's creating. Micro software pioneer Gordon Eubanks is featured in Part 2, with an overview of the data base software available for micro computer users. Part 3 takes a look at Lotus Developments' success with 1-2-3,™ the product that caught the market by storm. And finally, in Part 4, experts discuss communications as the most powerful PC application.

What makes these Conference Journal cassettes popular with today's businesses? They can be viewed anytime, in the convenience of your office, and they're available now.

To order, or to find out about other Conference Journal tapes, just call DELTAK at (800) 532-7686; in Illinois, (312) 369-3000. And don't just pop the questions: pop the answers, too.

© 1984, DELTAK/CW Communications
1-2-3™ is a registered trademark of
Lotus Development Corporation.

DELTAK
East/West Technological Center
1751 West Diehl Rd., Naperville, IL 60566
(312) 369-3000 (800) 532-7686

CW COMMUNICATIONS/INC.
375 Cochituate Road
Box 880, Framingham, MA 01701
(617) 879-0700

COMPUTER INDUSTRY

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Israeli compatibles trying U.S. market

While the fortunes of U.S. vendors of IBM-compatible mainframes seem to be waning, the U.S. market for compatible machines seems to become ever more attractive to foreign companies. While attention focuses mainly on the Japanese, an Israeli company recently slipped quietly ashore in Florida.

Elbit Computers Ltd., reportedly Israel's largest manufacturer of computer products and majority-owned by the Elron Industries conglomerate, recently assigned North American distribution and marketing rights for its 6341 computer series to Nicholas International, Inc., a high-tech trading company based in Palm Harbor, Fla.

Elbit's 6341 series is a family of processors compatible with IBM's 370 and 4300 series. The machines are reportedly modular in design and field-upgradeable.

The machines will be distributed to OEMs and certainly do not present any great threat to IBM. But, according to Bill Redfield, director of product marketing with Nicholas International, Elbit's move into the U.S. market presents "another well-priced IBM-compatible processor out there" with a stable manufacturer backing it up.

Elbit claims more than 1,000 installations in Europe, not bad for a company that is virtually unknown in the U.S.

While the ravaging inflation of the Israeli economy might cause some to wonder about the price competitiveness of Israel's companies, Redfield was quick to point out that the U.S. arrangement is based on U.S. dollars only.

■

It's pretty hard to imagine that IBM Chairman John R. Opel found much sympathy when he lashed out at the Europe-

See **IBM** page 158

Cullinet buy broadens outlook

By Peter Bartolik
CW Staff

WESTWOOD, Mass. — Cullinet Software, Inc. recently moved to expand its presence in the banking industry with the announcement of its intent to acquire Bob White Computing and Software, Inc. (BWCS) and develop a "fully integrated solution to the banking industry."

The acquisition will cost Cullinet about $8.6 million, but final details on the financial terms have yet to be set, and the board of directors of both companies must approve the agreement, according to a Cullinet spokesman.

BWCS, a developer of banking software applications, will operate from its Oak Brook, Ill., headquarters as a wholly owned subsidiary of Cullinet and will focus its efforts on integrating its application packages with Cullinet's relational data base management system, IDMS/R, Cullinet said.

Announcing the agreement, Cullinet President Robert N. Goldman said: "With

See **BANK** page 158

MPG moving into DBMS mart

By Paul Gillin
CW Staff

PRINCETON, N.J. — Mathematica Products Group, Inc. (MPG) is getting ready to take on the heavy hitters. After nearly 10 years as a name player in the fourth-generation language field, MPG wants to establish itself as a force in the large-scale data base management systems (DBMS) market.

Its approach is enigmatic. Most large data base vendors have been de-emphasizing their basic products in recent years in favor of new tools for end-user and programmer productivity. With more than 1,200 installations of Ramis II, MPG has already covered that field quite well. But that does not necessarily work to its advantage. Fourth-generation languages have always been perceived as a weak-sister DBMS — impressive on small applications and reports, but too inefficient to support the really important production data bases.

MPG doesn't dispute the fact that its

See **MPG** page 154

High tech not economy's savior: study

CAMBRIDGE, Mass. — The high-technology sector "is neither the economic savior nor the overtouted false hope" of the U.S. economy, according to a study by MIT researchers.

Instead, high technology is a small but very important part of a larger system of innovation, said David L. Birch, director of the Program on Neighborhood and Regional Change at MIT.

High technology was found to be relatively unimportant as a direct creator of employment. Computers, electronic components, communications equipment and aeronautics equipment accounted for just 2.8% of jobs and 5% of employment growth during the 1980s, according to the recently completed study.

Titled "The Role Played by High Tech in Job Creation," the 68-page study was written by Birch and Susan J. MacCracken, an MIT graduate and former assistant director of research for the Program on Neighborhood and Regional Change.

The high-tech industry's importance to job creation can be compared with the agricultural industry. Although neither industry creates a large number of jobs, both provide the essential components upon which the rest of the economy is based. "Remove it, or even fail to encourage it, and the rest of the economy dies quickly," the study stated.

See **STUDY** page 152

INSIDE

- ■ Apple Computer, Inc. emerged victorious in separate court rulings in Philadelphia and Australia involving Apple lookalikes/**141**
- ■ Amdahl Corp. vehemently denied reports that it has put an indefinite hold on its 5860 and 5868 multiprocessors/**140**
- ■ Boeing Co.'s computer group was barred by the Interior Department from receiving government contracts for one year/**141**

A Way to Keep Computers on the Right Track

The Beall Channel Switch. Lets you switch critical on-line services to another CPU when failure occurs. Allows specific peripherals to serve more than one computer. Redrives all CPU signals to give you far more flexibility for physical placement of peripherals.

And Beall does all of this less expensively, more reliably and with less opportunity for operator confusion than anyone else.

We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Want to track down more facts? They're in our new brochure. Write or call for it today.

John Beall & Company, Inc.
9103 Third Avenue ■ North Bergen, N.J. 07047 U.S.A. ■ 201/854-3562

We fly more plac

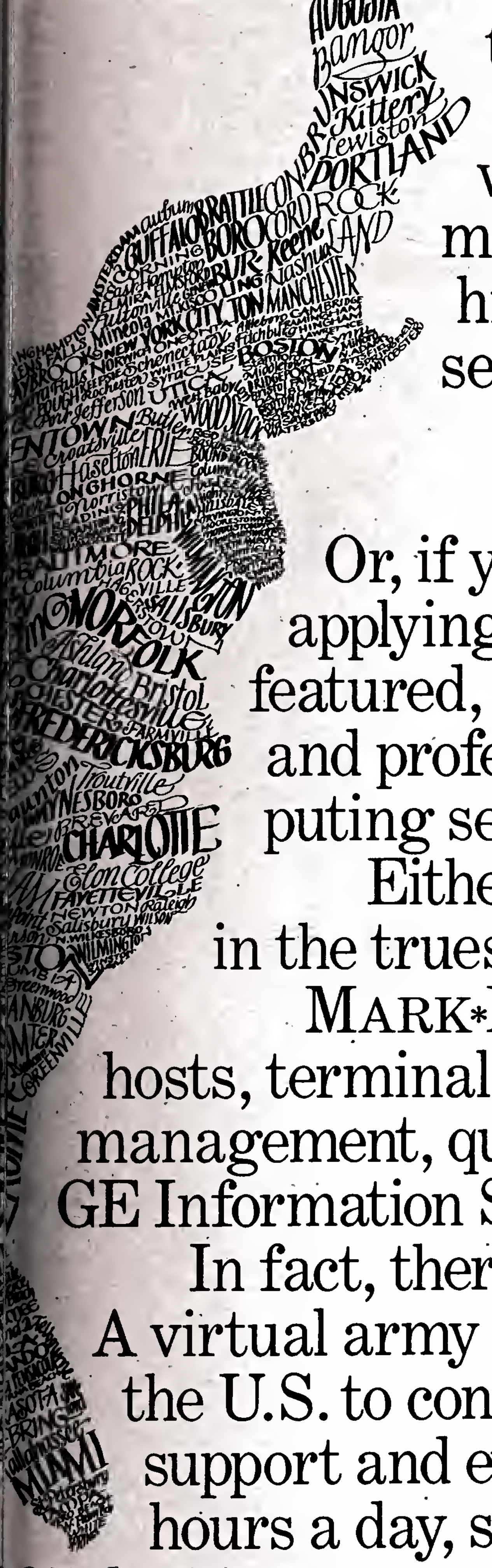
Hang on to your seats.

Because now there's a new way to move information. The MARK*NET™ value-added network from GE Information Services.

It links over 600 cities in the U.S. Meaning you can move information less expensively, more reliably, and yes, to more places than you ever could before.

Yet that really isn't so surprising when you stop to realize MARK*NET Service is based on the largest commercially-available

s than anybody.



teleprocessing network in the world. The one that connects over 750 cities around the world. And that, after 14 years of serving major corporations, has achieved the most highly acclaimed reliability, data integrity and security in the industry.

But now for the latest news.

You can opt for MARK*NET fly-only service. Or, if you need help preprocessing, postprocessing or applying your information, take advantage of our full-featured, fly-and-process service. With all the software and professional resources of the largest network computing service in the world at your disposal.

Either way, you'll be getting a value-added network in the truest sense of the word.

MARK*NET includes all the connections for popular hosts, terminals and protocols. And the complete network management, quality, security and service you associate with GE Information Services.

In fact, there's actually a network to support the network. A virtual army of 3,500 professionals distributed throughout the U.S. to consult and help you with installation, training, support and even Bell connection problems. On call 24 hours a day, seven days a week, 65 days a year.

Of course, you might have expected hat from someone with initials like ours.

But that makes it that much easier to emember who to call the next time your formation needs to fly.

Call us at (800) 638-9636, ext. 3001. r contact us by electronic mail.*

CW-6/11-N

GE Information Services Company
Manager of Client Services, 401 North Washington Street
Rockville, Maryland 20850

Name__________ Title__________
Company__________
Street__________
City__________ State______ Zip______
Tel. no.__________ Telex__________

INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

*You can use any ASCII terminal. In the U.S. call 800-638-8369. Listen for the computer tone and insert the telephone into the coupler. Press the "H" key several times, then the carriage return key. The system will then request that you enter a user number. Enter REK10150, MNET. The system will then prompt you.

DOD asks defense contractors to speed Ada applications

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The top brass of the Pentagon is appealing to the country's leading defense contractors to step up software applications written in the Ada programming language.

"The speed of emergence of new [Ada-based] software is not what it should be," Dr. Edith Martin, Deputy Undersecretary of Defense for Research and Advanced Technology, said in a recent address here before the National Security Industrial Association (NSIA), a group promoting defense industry cooperation.

Martin urged greater efforts to accelerate the introduction of Ada programming technology into so-called artificial intelligence weapons, which are easier to master and upon which the armed forces will increasingly depend.

Ada has been designated the standardized programming language by the Defense Department for the next generation of smart computers that are increasingly finding their way into weapons systems. It is a rigorous, strictly structured programming language that the defense establishment hopes will lead to transportability, ease of use and a reduction in the massive investments it is now making in software and software maintenance.

The NSIA conference held here late last month heard representatives from numerous defense contracting firms describe the latest research developments that they are introducing. Enabling faster turnaround times for computers embedded within a weapons system is the goal so that they can make sense of streams of data that represent cognitive information usually handled by humans.

Dr. Edward Lieblein, director of Computer Software Systems in the Defense Department's office of Research and Engineering, said that the Defense Department plans to spend approximately $1.7 billion on Ada software development programs in the next five years in the form of private sector contract awards. He compared this pace with the so-called fifth-generation computer development, which encompasses artificial intelligence, now being pushed in Japan. He said Japan has only spent $40 million on the project in the last three years, but will expand this to $300 million over the next three years.

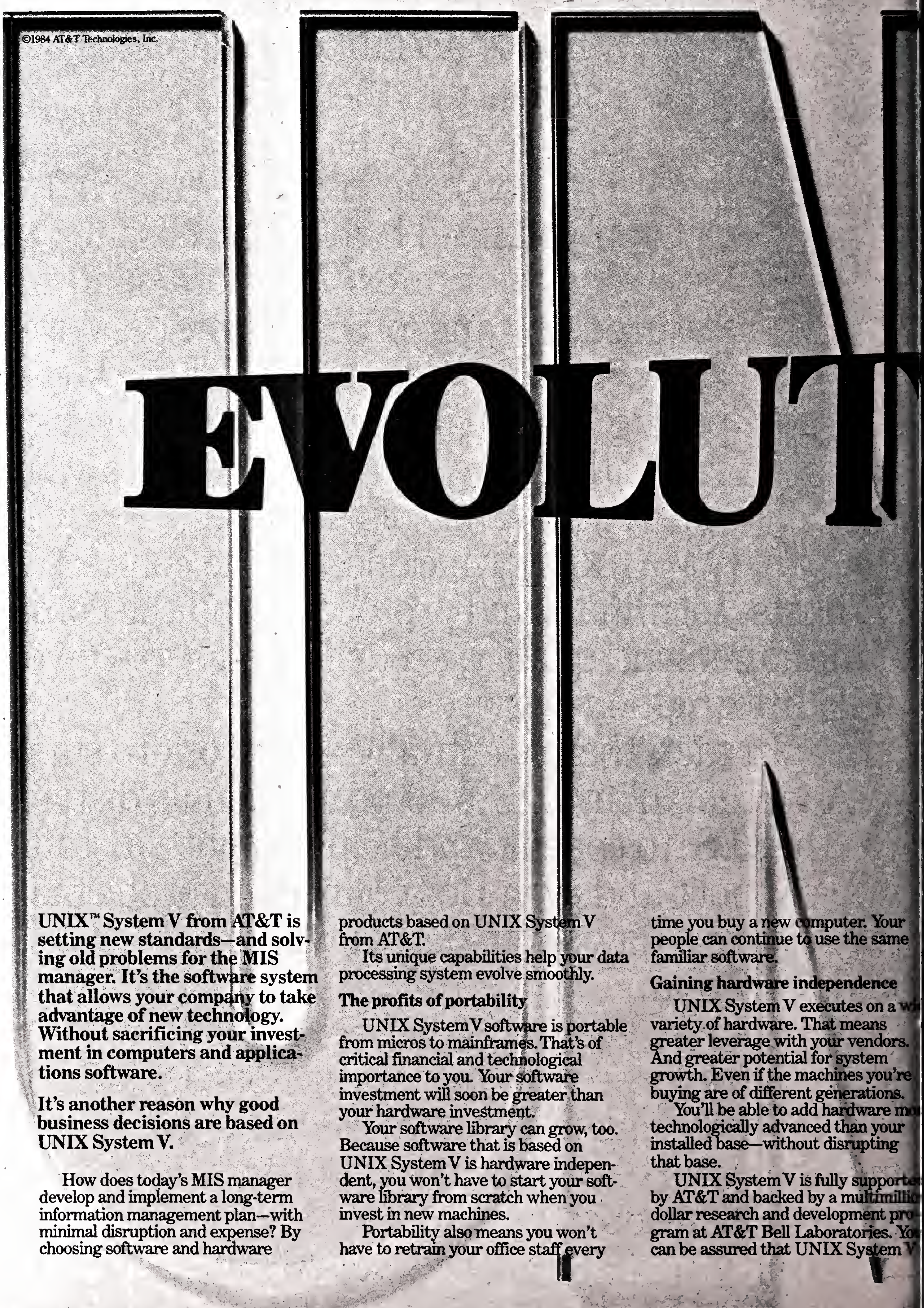
Lieblein said that the push to introduce artificially intelligent computers into weapons systems will mean a "tremendous increase in the number of lines of code over the 200 million to 300 million that already exist."

Amdahl delays 580

SUNNYVALE, Calif. — Amdahl Corp. said recently it has pushed back the shipment dates on two multiprocessor versions of its 580 series mainframes, but will begin general shipping of one version in the second quarter of 1985.

Angrily denying a published report that the company had put the 5880 and 5868 models on hold indefinitely, company spokesman Richard Whitcomb said shipments of those models were deferred in order to satisfy customer demand for the dual- or attached-processor models 5867 and 5870.

"We are letting the multiprocessors slip a little, but we have a very definitive schedule," Whitcomb said. The 5867 and 5870 will be generally available in the third quarter of 1984, Whitcomb said. The 5868 will be shipped through Amdahl's "early support program" in the first quarter of 1985, he said.



©1984 AT&T Technologies, Inc.

UNIX™ System V from AT&T is setting new standards—and solving old problems for the MIS manager. It's the software system that allows your company to take advantage of new technology. Without sacrificing your investment in computers and applications software.

It's another reason why good business decisions are based on UNIX System V.

How does today's MIS manager develop and implement a long-term information management plan—with minimal disruption and expense? By choosing software and hardware products based on UNIX System V from AT&T.

Its unique capabilities help your data processing system evolve smoothly.

The profits of portability

UNIX System V software is portable from micros to mainframes. That's of critical financial and technological importance to you. Your software investment will soon be greater than your hardware investment.

Your software library can grow, too. Because software that is based on UNIX System V is hardware independent, you won't have to start your software library from scratch when you invest in new machines.

Portability also means you won't have to retrain your office staff every time you buy a new computer. Your people can continue to use the same familiar software.

Gaining hardware independence

UNIX System V executes on a w
variety of hardware. That means greater leverage with your vendors. And greater potential for system growth. Even if the machines you're buying are of different generations.

You'll be able to add hardware m
technologically advanced than your installed base—without disrupting that base.

UNIX System V is fully support
by AT&T and backed by a multimilli
dollar research and development pro-
gram at AT&T Bell Laboratories. Yo
can be assured that UNIX System

Apple wins two court battles in war against fakes

By Peter Bartolik
CW Staff

Apple Computer, Inc. won victories on opposite sides of the globe recently in its continuing battle against so-called Apple fakes. Additional convictions were handed down in Philadelphia against importers of Apple look-alikes, and an Australian federal appeals court extended copyright protection to Apple II programs contained in read-only memory.

In Philadelphia, a businessman and the two firms he operated were convicted of criminal conspiracy and smuggling counterfeit copies of Apple IIs. The charges are felonies and could result in prison sentences of five years on each charge and fines of up to $20,000.

In Sydney, the Federal Court overturned an earlier ruling [CW, Dec. 19] by a federal judge who had declared, in a potentially far-reaching decision, that computer programs could not be considered literary works under Australia's copyright laws.

The Philadelphia criminal case marked the conclusion of federal prosecutions begun earlier this year [CW, Jan. 20] against six individuals and five companies in two separate cases involving the importation of Apple look-alikes.

Robert Ellis, 53, was found guilty by a federal jury of criminal conspiracy and smuggling charges based on government allegations that he had asked Taiwanese manufacturers to ship computer components to the U.S. in mislabeled packages. Assistant U.S. Attorney Ewald Zitlau said no date has yet been set for sentencing.

Ellis was the only one of the six individuals to pursue a trial. Earlier, David Ellis, 26, pleaded guilty to a misdemeanor charge of conspiracy to violate the copyright act and will be sentenced this month. Joel M. Isadore, 29, had earlier pleaded guilty to misdemeanor conspiracy charges involving both Philadelphia cases and had been handed a six-month prison sentence [CW, April 30].

David Noble of Australasian Computerworld *contributed to this report.*

Boeing group barred from federal bids

WASHINGTON, D.C. — The U.S. Department of the Interior has barred Boeing Computer Services Co.'s Federal Systems group from receiving government contracts for at least one year, charging that the company illegally benefited from confidential bidding information.

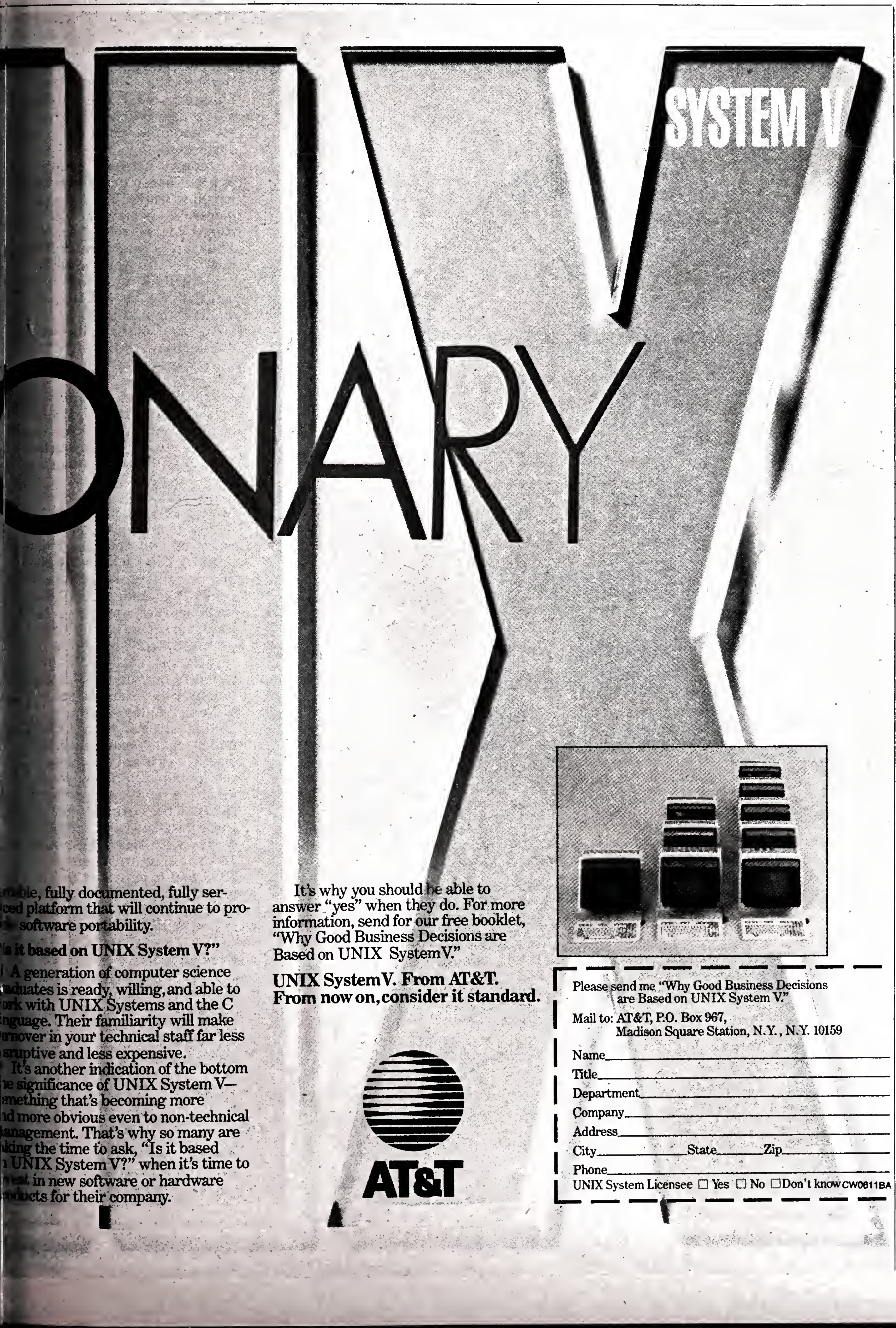
The government's action stems from an Interior Department investigation that determined that officials of the Boeing subsidiary helped write part of the bidding documents for a $5.9 million software development contract the group won from the National Parks Service in March. The contract, which now has been terminated by the government, was for a financial and cost-tracking system, said Tom Wilson, an Interior Department spokesman.

Wilson said the investigation is continuing. The agency is trying to determine what part officials of the Parks Service or Interior Department played in helping Boeing obtain confidential information.

The department was tipped off to the alleged violation in a complaint filed by Informatics General Corp., a Woodland Hills, Calif., software company that also bid for the contract.

Harold Carr, a Boeing spokesman in Seattle, would neither confirm nor deny the company's involvement in the alleged illegality.

Boeing has 30 days from May 29 in which to respond to the action.



ble, fully documented, fully ser-
ced platform that will continue to pro-
software portability.

s it based on UNIX System V?"

A generation of computer science
aduates is ready, willing, and able to
ork with UNIX Systems and the C
nguage. Their familiarity will make
rnover in your technical staff far less
sruptive and less expensive.

It's another indication of the bottom
e significance of UNIX System V—
mething that's becoming more
d more obvious even to non-technical
anagement. That's why so many are
king the time to ask, "Is it based
UNIX System V?" when it's time to
in new software or hardware
ducts for their company.

It's why you should be able to answer "yes" when they do. For more information, send for our free booklet, "Why Good Business Decisions are Based on UNIX System V."

UNIX System V. From AT&T.
From now on, consider it standard.

Please send me "Why Good Business Decisions are Based on UNIX System V."

Mail to: AT&T, P.O. Box 967,
Madison Square Station, N.Y., N.Y. 10159

Name__________
Title__________
Department__________
Company__________
Address__________
City_____ State_____ Zip_____
Phone__________
UNIX System Licensee ☐ Yes ☐ No ☐ Don't know CW0611BA

MDC chief foresees growth of market for data bases

Creative use of micros at core of market expansion in on-line industry

By John Desmond
CW Staff

BOSTON — In an address on new markets given at the Information Industry Association's meeting here recently, Jack Simpson, president of Mead Data Central (MDC), a division of Mead Corp., said that the incredible proliferation of microcomputers in offices and homes will create a substantial market for data bases during the 1980s.

MDC provides a series of on-line data bases, including Lexis for computer-assisted legal research, Nexis for news, Lexpat for patent information and Exchange for financial information. The company began with Lexis in 1973.

The electronic publishing market will benefit from growth in the microcomputer and software segments of the industry, he said. The installed base of microcomputers is now 3.5 million, he said, estimating that one million of those are IBM machines.

An average of 6,000 IBM Personal Computers are being installed daily in 1984, and 12 million more are projected to be installed by 1986, he pointed out. "On top of the [personal computer] base is the software industry," which is projected to reach $10 billion this year, he said.

On-line industry moving slower

The on-line industry, which includes Mead and is growing at a slower rate, generated $1.2 billion in revenues in 1983 and is projected to reach $3.5 billion by 1988, Simpson said. "The professional user will be the greatest potential market," he suggested.

Today's personal computer user "doesn't care how the machine works. They see the [personal computer] as a means to an end," he said. Thus, users consistently find new uses for their computers, thereby creating new markets for the on-line industry, Simpson said.

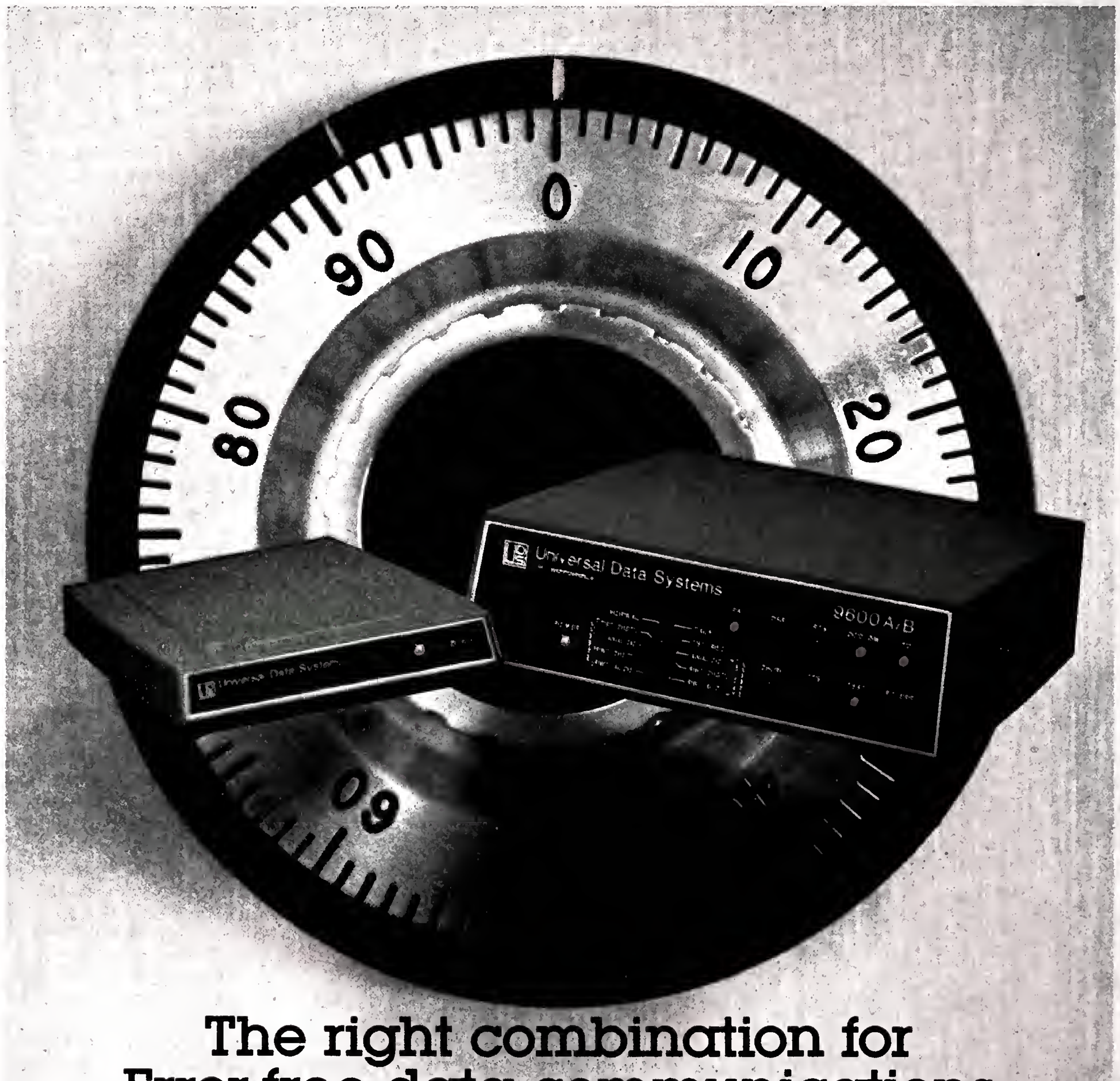
In the on-line industry market today, 46.5% of all requests are for business-related information, 26.8% for credit information, 10.6% for legal information and 3.5% for news information, according to Link Resources Corp., an on-line industry consulting firm.

Lexis today contains 30 billion characters and 2.8 million documents. Each week, 12,500 documents are added. "You never really finish a data base," Simpson said. The professional services market, including the legal market served by Lexis, provided $187.1 million in revenues in 1983 and is projected to provide $539.2 million by 1988, Simpson said.

Nexis today contains 9 million articles with 17,000 added each week. Business uses of Nexis are primarily in the public relations, public affairs and advertising fields. The business use of these data bases, which MDC serves with Nexis, provided $43.2 million in revenues in 1983 and is expected to provide $338.2 million in revenues by 1988, a 51% annual rate of growth, Simpson said.

MDC began offering its Exchange data base on May 1. It provides financial information on such things as backgrounds of mergers and acquisitions, research for investment decisions, research for loan requests, legislation, litigation and world news. Simpson said the idea for Exchange came from tracking the types of business community information requests made on Nexis.

The business information segment of the on-line industry market is also projected to grow from $907.3 million in 1983 to $2.2 billion by 1985, a 20.6% annual rate of growth, Simpson said.



The right combination for Error-free data communications

At 9600 bps on the dial-up network, line conditions often introduce unacceptable data communications errors. Even the finest of modems—like our 9600 A/B—can't handle the problem alone.

The answer is a combination; add our EC100 Error Controller at each end of the line and limit data defects to one every *several years.*

Using standard detection and flow control techniques, the EC100 is synchronous to the modem and asynchronous to the terminal at any speed from 150 to 9600 bps. The device is transparent to data, and it supports asymmetrical data rates at the terminals.

★ NCC '84
Booth #B-3238

By adding an EC100 to a 9600A/B, a 208A/B, a 201B/C or a 212A, you can optimize the throughput of your dial-up system while enjoying an error-free environment. With the EC100 priced at only $495, that's an excellent investment in accuracy.

For details, contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 205/837-8100; TWX 810-726-2100.

Universal Data Systems

MOTOROLA INC.
Information Systems Group

UDS modems are offered nationally by leading distributors. Call the nearest UDS office for distributor listings in your area.
DISTRICT OFFICES: **Atlanta**, GA, 404/998-2715 • **Bellevue**, WA 206/455-4429 • **Blue Bell**, PA 215/643-2336 • **Boston**, MA, 617/875-8868 • **Columbus**, OH, 614/895-3025 • **Englewood**, CO, 303/694-6043 • **Glenview**, IL, 312/998-8180 • **Houston**, TX, 713/988-5506 • **Huntsville**, AL, 205/837-8100 • **Mountain View**, CA, 415/969-3323 • **Old Bridge**, NJ, 201/251-9090 • **Richardson**, TX, 214/680-0002 • **Silver Spring**, MD, 301/587-0166 • **Tampa**, FL, 813/684-0615 • **Tustin**, CA, 714/669-8001

If you're not in *Computerworld's* next five special reports, look at the issues you'll miss

July 2

NCC Preview issue

A detailed roundup of the vendors and products to see at the show (complete with booth numbers). Plus we'll take a look at the special attractions in Las Vegas.

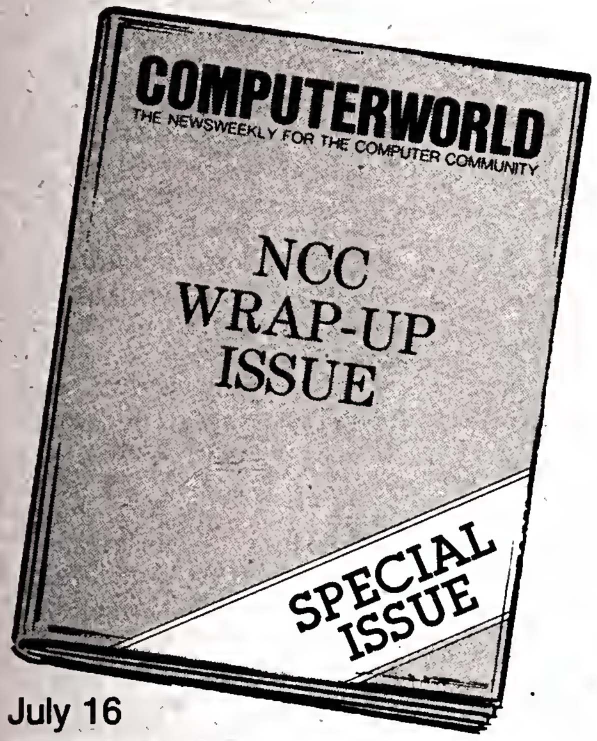
Closes June 15

July 9

NCC Show issue

We'll highlight *Data Pro's* yearly hardware survey. Readers always enjoy studying other user's candid ratings of systems and vendors.

Closes June 22



July 16

NCC Wrap-up issue

Part 2 of *Data Pro's* hardware survey. Also, we'll recap the major product announcements and happenings at the show.

Closes June 29

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
MINIS AND SMALL BUSINESS SYSTEMS
SPECIAL ISSUE

August 27

Minis and small business systems

We'll take a close look at the growing number of applications. Plus we'll include reports from users on the problems they've had in selecting and implementing these systems, and how they solved. Also, we'll offer vendors' suggestions on how to increase the efficiency and cost-effectiveness of minis and small business systems.

Closes August 10

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
DATA BASE MANAGEMENT SYSTEMS
SPECIAL REPORT

September 24

Data Base Management Systems

A comprehensive report geared toward a realistic understanding of DBMS. We'll include articles on how to evaluate, select, implement, and trouble-shoot DBMS. And we'll update recent developments, as well as offer users' solutions to common and not-so-common DBMS problems.

Closes September 7

Call the Sales Office nearest you to reserve space in any of our upcoming issues. Or, if you prefer, fill out the coupon below and return it to: Ed Marecki, National Sales Director, Computerworld, 375 Cochituate Road, Box 880, Framingham MA 01701. Do it today.

To: Ed Marecki
National Sales Director
CW Communications/Inc.
Box 880Framingham MA 01701

Please send me advertising information on:

☐ *NCC Preview issue*
☐ *NCC Show issue*
☐ *NCC Wrap-up issue*
☐ *the Minis and Small Business Systems issue*
☐ *Data Base Management Systems*
☐ Please have a sales representative call me.

Name ____________________
Title ____________________
Company ____________________
Address ____________________
City __________ State ____ Zip ________
Telephone ____________________

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Sales Offices

BOSTON: 375 Cochituate Road, Box 880, Framingham MA 01701, (617) 879-0700; CHICAGO: 2600 South River Road, Suite 304, Des Plaines IL 60018, (312) 827-4433; NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus NJ 07652, (201) 957-1350; ATLANTA: 1853 Peeler Road, Suite D, Atlanta GA 30338, (404) 394-0758; SAN FRANCISCO: 300 Broadway, Suite 20, San Francisco CA 94133, (415) 421-7330; LOS ANGELES: 18008 Sky Park Circle, Suite 260, Irvine CA 92714, (714) 261-1230

IRS review of Finalco ends

MCLEAN, Va. — Finalco Group, Inc. recently announced it reached an agreement with the Internal Revenue Service concluding an IRS review of Finalco's tax-advantaged transactions.

"This agreement allows us to return to normal business operations and should positively affect the remainder of our 1984 fiscal year and the years to come," said Jon J. Prager, chairman and chief executive officer of the company.

Finalco said it agreed to an assessment of $1,000 on one of seven transactions that the IRS selected for review. The review of sale and lease-back transactions covered the period from Sept. 4, 1982, to Dec. 16, 1983.

Finalco said it agreed to the assessment "to avoid protracted litigation over a minor amount and to terminate the IRS review."

Earlier, Finalco had announced its earnings for the nine months ended March 31 were $1.3 million, or 25 cents per share, compared with $4.6 million, or 56 cents per share, for the firm's comparable period one year earlier.

According to a spokesman for the company, the decreased earnings were "primarily caused by the disruption of business associated [with the IRS review]."

EXECUTIVE CORNER

David A. Deardorf has been named general manager of Raytheon Co.'s Semiconductor Division.

■

James J. Macchiarola has joined Paradyne Corp. as director of administrative systems implementation, and **David R. Grant** has been promoted to vice-president, operations, International Group.

■

Dataproducts Corp. announced the following promotions: **Ronald N. Iversen**, general manager, nonimpact printer division; **John D. Kingman**, vice-president and general manager, medium-speed line printer division; **Dennis King**, general manager, supplies division.

■

Stuart J. Miller has been elected president and chief executive officer of Software AG Systems, Inc. and its operating subsidiary, Software AG of North America, Inc.

■

Jay A. Keller has been named president and chief executive officer of Source Telecomputing Corp.

■

James H. Richardson has been named vice-president of operations and advanced development at Saber Technology Corp.

■

James J. Greed Jr. has been named director of technology for the semiconductor equipment group at General Signal Corp.

■

Thomas P. McAuliffe has been elected president and chief executive officer of Pilot Executive Software.

■

Goal Systems International, Inc. announced a corporate management change, due to the growth and expansion the company has experienced. **Steve O'Donnell**, former president, will assume the position of chairman of the board, and **James A. Rutherford** has been elected president.

■

Norbert St. John, a vice-president and the director of Southern California market operations for Hall-Mark, has assumed the role of acting manager of the firm's San Fernando Valley distribution center. **George Rea** has been named manager of Hall-Mark's Orange County distribution center.

■

Fairchild Industries, Inc. announced that its directors have elected **George S. Attridge, Emanuel Fthenakis** and **Donald B. Rassier** executive vice-presidents. The company also announced it has reorganized into three business groups. Attridge was named chief executive officer of the commercial/industrial group; Fthenakis has become chief executive officer of the communications, electronics and space group; and Rassier was named chief executive officer of the new aerospace group, which includes military and commercial aircraft.

■

Computer Sciences Corp. has announced the following promotions for its applied technology division: **Dr. David W. Dunkely**, director of the San Diego center; **Vaughn M. Sones**, director of the Fort Lee, Va., center; **Walter G. Boeck**, director of the Camarillo, Calif., center; and **Michael W. Laphen**, vice-president, finance and administration.

■

Lawrence Seligman, executive vice-president of office and computer products at Datapoint Corp., has resigned to pursue personal business interests.

■

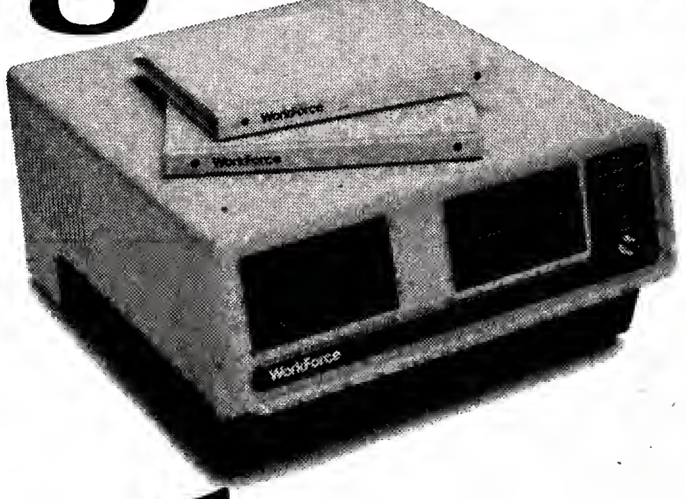
Gerald A. Lembas, senior vice-president, corporate secretary and a director of Tandon Corp., has resigned to pursue private investment interests. He remains a director of the company.

■

Van C. Lewing has been named vice-president of electronic artwork/computer-aided manufacturing systems at Calma Co.

See **EXEC** page 149

Application Programmer.



Ambitious Salesman.

Introducing the WorkForce™ Development System.

A powerful hardware/software combination that lets you take custom turnkey systems to market faster, easier than ever before.

Thanks to WorkForce—a 68000-based, multi-user system that's built for dependability and expandability.

And thanks to a software system with an advanced COBOL program generator and built-in word processing, DBMS and spreadsheet packages. Packages that integrate perfectly with the custom programs you design yourself.

With this combination, you can create consistent code, making custom-designing faster and simpler. You can spend more time developing and less time programming. You can offer the most comprehensive solutions your customers will ever use. And because the code is so consistent, it's easy to maintain.

The WorkForce Development System. Put our application programmer to work for you. And watch it sell itself, ambitiously.

WorkForce™
Good help isn't hard to find.

WorkForce, c/o Digital Datacom, Inc.,
27721 South La Paz Road, Laguna Niguel, CA 92677 (714) 831-8470.

Cullinet: I'd like both.

☐ Please send me more information about IDMS/R
☐ Please have a Cullinet representative call on me
☐ I'd like to attend a seminar in ______________ on __________
(CITY) (DATE)

Albany, NY	June 12	Knoxville, TN	June 13	Orange County, CA	June 19
Atlanta, GA	June 19	Lexington, KY	June 27	Providence, RI	June 14
Bloomington, IL	June 26	Los Angeles, CA	June 28	Raleigh, NC	June 21
Cedar Rapids, IA	June 26	Merrimack, NH	June 19	Regina, SK	June 13
Chicago, IL	June 12	Milwaukee, WI	June 14	Rochester, NY	June 21
Cincinnati, OH	July 18	Minneapolis, MN	June 21	St. Louis, MO	June 19
Cleveland, OH	July 11	Montreal, PQ	June 19	Salt Lake City, UT	June 27
Columbus, OH	June 27	New York, NY	June 20	Seattle, WA	June 12
Denver, CO	June 13	New York, NY	July 24	South Bend, IN	June 21
Detroit, MI	June 19	New York/Long Island, NY	June 14	Tallahassee, FL	June 20
Ft. Wayne, IN	July 11	New York/Rye, NY	June 12	Toronto, ON	June 21
Ft. Worth, TX	June 12	Norfolk, VA	June 14	Ventura, CA	June 26
Grand Junction, CO	June 20	Oakbrook, IL	July 12	Washington, DC	June 28
Indianapolis, IN	July 10	Oakland, CA	June 26	Winnipeg, MB	June 12
Kansas City, MO	June 28	Omaha, NE	June 13		

Name/Title ______________________________

Company/Department ______________________________

Address ______________________________

City/State/Zip ______________________________

Telephone ______________________________

CW 6/11

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 423 NORWOOD, MA 02062

POSTAGE WILL BE PAID BY ADDRESSEE

Cullinet Software, Inc.
Attention: Marketing Communications
400 Blue Hill Drive
Westwood, MA 02090-9973

For the 4300 user prepared to sacrifice performance for ease of use in a relational dbms, two little words:

Get both.

You're in a tough position.

You've got management telling you they want the system up and running *yesterday.* And you've got a small technical staff that simply doesn't have the time to learn complex new skills.

So it's no surprise that your inclination is to settle for something less in your choice of databases.

In response, we have just one word of advice: *don't.* With Cullinet's new relational database, IDMS/R, you can have the best of both worlds – ease of use *and* performance – from the acknowledged leader in database management software.

IDMS/R is a powerful relational database that greatly reduces the time it takes to develop applications. Its facilities are so simple to use, your end users can develop applications without intervention from your data processing staff. All they have to do is define a relational record, and IDMS/R does the rest.

IDMS/R is also extremely flexible. It's a system that *anticipates* change by providing for the dynamic definition and redefinition of your relational database.

You'll also appreciate the fact that IDMS/R conserves your finite data processing resources. With a feature called "Relational Fastpath," you can tune the database and thus benefit from a dramatic boost in performance. It's this feature, in particular, that makes IDMS/R a high performance relational dbms.

And while the product itself has so much to recommend it, we'd be remiss if we failed to point out what our more than seven hundred 4300 users already know – namely, that it comes with the level of service and support Cullinet is noted for. Educational training, technical support, even a 24-hour hotline.

To find out more about IDMS/R, the database that combines high performance and ease of use, contact Cullinet.

The company that doesn't ask you to make sacrifices.

CW6/11

I'd like both.

Name/Title____________________

Company/Department____________________

Address____________________

City/State/Zip____________________

Phone____________________

Send to: Cullinet Software, 400 Blue Hill Drive, Westwood, MA 02090-2198

Database: Cullinet

© 1984 Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090-2198
Phone, toll-free, 1-800-225-9930. In MA, 617-329-7700.

NICKELS AND DIMES

Boole and Babbage, Inc. reported profits for the first six months ended March 30 were $707,000, or 26 cents per share, compared with $435,000, or 18 cents per share, in 1983. Revenues were $13.4 million, compared with $10 million in 1983.

■

Aydin Corp. reported profits for the first quarter ended March 31 were $3 million, or 65 cents per share, down 7% from $3.3 million, or 70 cents per share, in 1983. Revenues were $34 million, down 9% from $37.3 million in 1983.

■

Cambex Corp. reported profits for its first quarter of $66,000, or 4 cents per share, compared with a net loss of $296,000, or 16 cents per share, in 1983.

■

Computer Technology International, Inc. earned $28,578 on total revenues of $688,366 during its first quarter, compared with a loss of $19,853 on revenues of $226,987 in 1983.

■

Printronix, Inc. reported operating results for the fiscal year ended March 30. Profits were $7.8 million, or $1.70 per share, on sales of $116.3 million. This compares with profits of $6.1 million, or $1.52 per share, on sales of $78.1 million for the previous year.

■

Drexler Technology Corp. announced results for the fourth quarter and fiscal year ended March 30. Profits for the year were $728,000, or 17 cents per share, down from $1.5 million, or 38 cents per share, for the previous fiscal year. Revenues of $17 million were up 27% over $13.4 million last year.

Fourth-quarter profits were $88,000, or 2 cents per share, down from $344,000, or 8 cents per share, for the prior year. Revenues increased 20% to $4.5 million, compared with $3.8 million last year.

■

Floating Point Systems, Inc. reported profits for the second quarter ended April 30 increased 39% to $3.6 million, or 41 cents per share, from $2.6 million, or 30 cents per share, for the same quarter of 1983. Revenues of $29.1 million were reported, compared with $23.1 million for the previous year.

■

Dataproducts Corp. reported annual results for the fiscal year ended March 31. Profits were $26 million, or $1.26 per share, compared with $13.7 million, or 70 cents per share, one year earlier. Revenues were $398.6 million, compared with $317.6 million a year ago.

Fourth-quarter revenues were $126.4 million, compared with $80.1 million a year ago. Profits were $10.6 million, or 51 cents per share, a 152% increase compared with $4.2 million, or 21 cents per share, for the same period one year ago.

■

Nynex Corp., the regional holding company consisting of New York Telephone Co. and New England Telephone Co., reported first-quarter profits of $221.7 million, or $2.29 per share, on revenues of $2.28 billion.

■

Automatix, Inc. reported it had a first-quarter 1984 loss of $2.3 million, or 22 cents per share. It also reported bookings and backlog of $6.8 million and $9 million, respectively. This compares with a net loss of $122,000, or 1 cent per share, for the first quarter of 1983, with sales of $2.6 million and with bookings and backlog of $4.1 million and $1.9 million.

The low sales level and as-

See **NICKELS** page 154

UniForum™
The International Conference of UNIX Users
January 21-25, 1985
INFOMART • Dallas, Texas

Call for Papers

/usr/group will present its second annual UniForum Conference and Trade Show in Dallas, Texas, January 21-25, 1985.

Our theme, *"The Worlds of UNIX"*, features four simultaneous tracks of conference sessions:

- UNIX and PC's
- Engineering/Programming/Design
- UNIX and Office Systems
- Market Trends and the Future of UNIX

We need your help to develop these four exciting topics into valuable conference sessions. To present a paper, submit your abstract to:

/usr/group
The International Network of UNIX Users
4655 Old Ironsides Drive, Ste. 200
Santa Clara, CA 95050
408-986-8840

Need general accounting software for IBM System/38?

We've simply solved your problem.

LAWSON ASSOCIATES has solved it with the first general accounting software specifically designed for IBM System/38. Not merely compatible, but state-of-the-art to fully utilize your computer's capabilities. Compare. You won't find a total software solution like it anywhere else.

DESIGN FEATURES:
They include: on line systems using data base management; menu driven, user friendly programs written in RPGIII, the System/38 language; and integrated modules. Their benefits: ease of installation and use, plus maximum employee productivity.

INTEGRATED MODULES:
Those available include: General Ledger and Report Writer/Accounts Payable/Accounts Receivable/Fixed Assets/Payroll/Personnel/Purchase Order/Order Entry/Inventory Control

SERVICE FEATURES:
Fully documented and supported. Onsite training and implementation. One year warranty. Available now for immediate installation.

For more information, please call or write:
Lawson Associates, 2021 East Hennepin Ave., Minneapolis, MN 55413
1-800-672-0200
In Minnesota call (612) 379-2633
LAWSON ASSOCIATES
WE SIMPLY SOLVE PROBLEMS

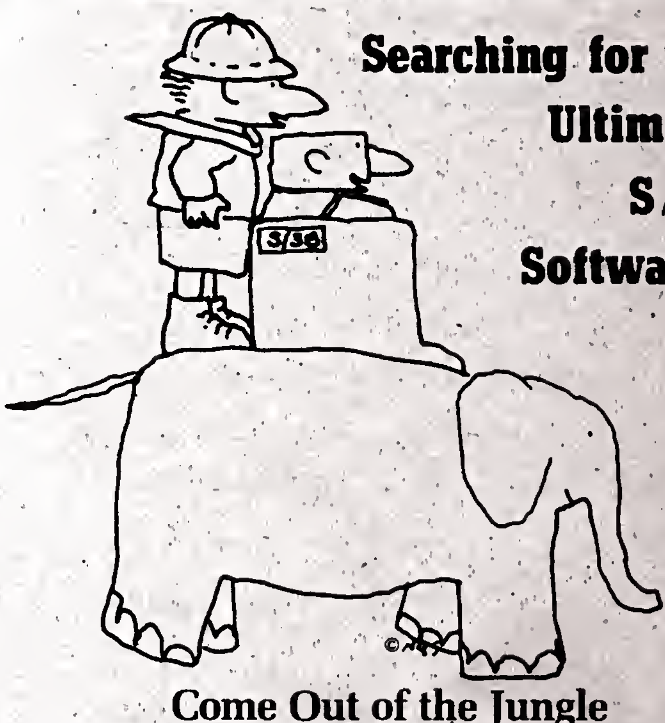
ON-LINE
HP3000 & DEC VAX
BUSINESS MANAGEMENT SYSTEMS

- CJ/PAYROLL™
- CJ/PERSONNEL™
- CJ/ADVANCED GENERAL LEDGER™
- CJ/ACCOUNTS PAYABLE™
- CJ/ACCOUNTS RECEIVABLE™
- CJ/FIXED ASSETS™

Written in COBOL. May be used as stand-alone modules or an integrated system complete with on-going:

SUPPORT • MAINTENANCE • ENHANCEMENT

COLLIER JACKSON, INC.
We bring software to life
3707 West Cherry St., Tampa, Florida 33607
(813) 872-9990



Searching for the Ultimate S/38 Software?

Come Out of the Jungle

Designed only for the S/38, the Finance/38™ modules respond through on-line report writers, flexible budgeting & user defined structures.

☑ YES! SEND MORE INFORMATION TODAY:

Name ______
Title ______
Company ______
Address ______
______ Phone ______

GL & AP Available now; AR, Payroll & Fixed Assets following soon! Don't get stuck with a white elephant. Call or write today.

NGS
NEW GENERATION SOFTWARE, INC.
341 Lincoln Street, Roseville, CA 95678 Phone 916 969-8448
Outside California Call Toll Free 800 824-1220

Raytheon chooses service chief

LEXINGTON, Mass. — Raytheon Co. recently announced the appointment of John C. Kingery as president of Raytheon Data Services and Leasing Co.

Data Services and Leasing is the company that was formed to provide support and service for customers of the Raytheon Data Systems Division, which was terminated recently [CW, May 28].

Kingery had served as senior vice-president of finance for Raytheon Data Systems since January.

The new company will provide continued support to Raytheon Data Systems' installed base, Raytheon said.

This installed base includes equipment and software maintenance, spare parts, supplies and leasing services for all existing customers, according to a spokesman for Raytheon.

Based in Norwood, Mass., the new company will employ 1,200 people, and services will be provided from Raytheon's existing 67 field offices, the firm said.

Raytheon Data Systems installed more than 200,000 data processing terminals that are compatible with IBM 3270 terminals and 20,000 of its Lexitron and Raytheon word processors, according to the vendor spokesman.

Delta Data granted FBI contract

WASHINGTON, D.C. — A federal judge recently issued a summary judgment here ordering the Federal Bureau of Investigation to award Delta Data Systems Corp. a computer equipment contract that had previously been awarded to System Development Corp.

The contract, for terminals, printers and service, is said to be worth $50 million.

System Development is a subsidiary of Burroughs Corp.

The FBI had awarded the contract to System Development in September 1983.

Delta Data protested, however, claiming it had submitted the lowest bid for the contract, which was to cover delivery of as many as 6,000 computer terminal workstations along with 3,000 printers and maintenance.

The FBI had previously suspended deliveries of equipment by System Development after the General Accounting Office last April issued a finding that the contract should have gone to the low bidder.

Following the decision, Robert Smallacombe, chairman of Delta Data, said that the company looks forward to cooperating with the FBI over the length of the contract. The contract will be in effect for eight years.

Burroughs picks staff appointees

DETROIT — Burroughs Corp. recently announced the appointment of Dr. Philip S. Dauber to president and chief operating officer of Memorex Corp., a Burroughs subsidiary.

Dauber joins Memorex Chairman and Chief Executive Officer Clancy W. Spangle in the newly formed Memorex Executive Office, Burroughs said.

Spangle has announced his intention to retire at the end of 1984, after heading Memorex since 1980.

Dauber previously served as president of Burroughs' system products group, a position he held since May 1982. He joined Burroughs in May 1981 as vice-president, technical operations.

Dr. Hollis L. Caswell was named to succeed Dauber as president of the system products group. He joined Burroughs last February as vice-president of corporate operations.

Caswell came to Burroughs from IBM, where he was vice-president of the firm's general technology division.

EXEC

from page 144

Robert Huberfeld, formerly director of federal government operations for Datapoint Corp., has been appointed president and chief operating officer of Intellimac, Inc.

■

Martin A. Goetz has been promoted to president and chief operating officer of Applied Data Research, Inc.

■

Robert R. Payne has been appointed president of Systems & Programming Resources, Inc.

■

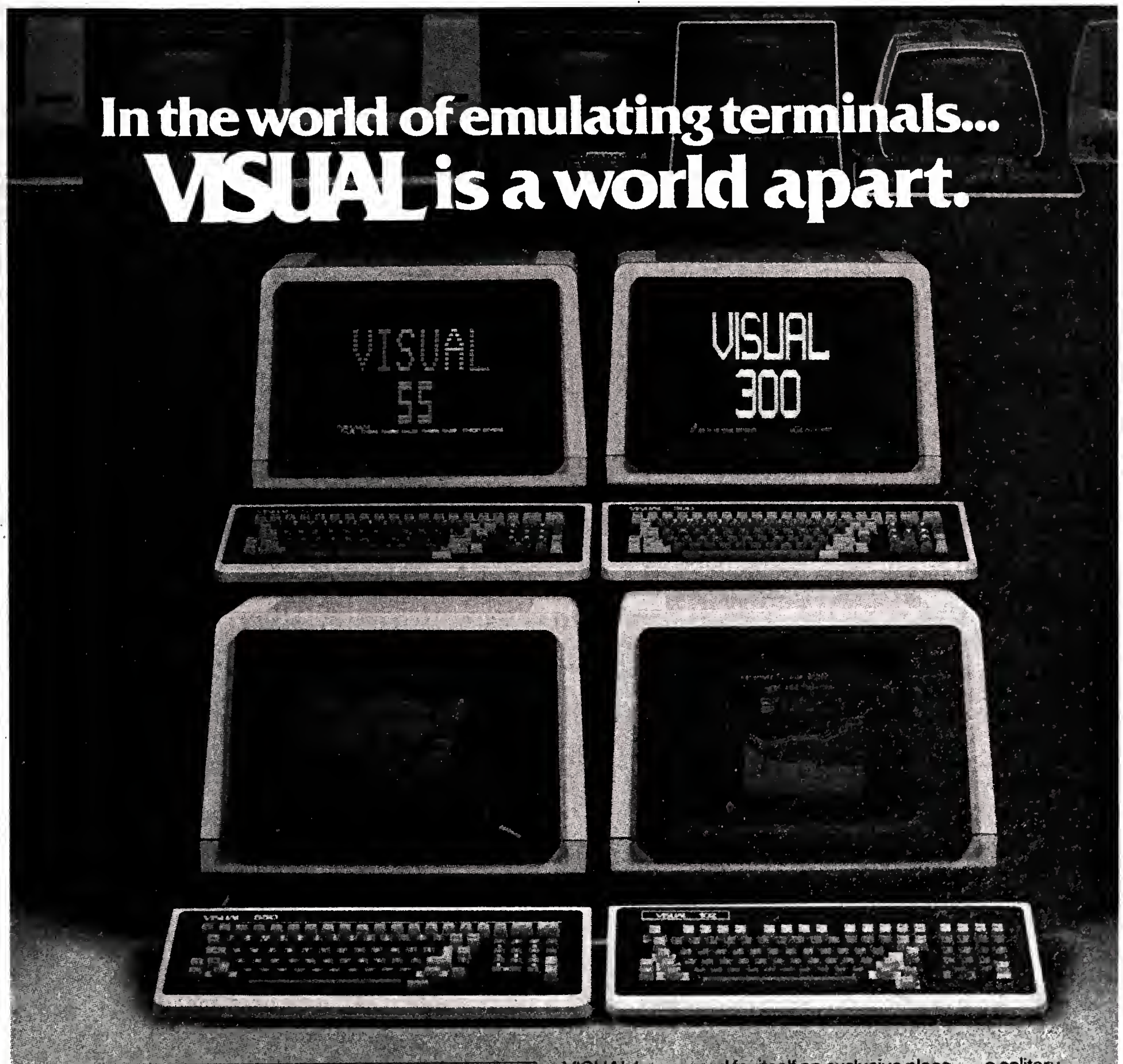
Robert M. Loonin has been named president and chief executive officer at National Computer Communications Corp.

■

James J. Conway has been elected senior vice-president, and **Philip C. Danford** has been elected treasurer of Perkin-Elmer Corp.

■

G. Roger Dorey, who has led Applied Microsystems Corp. through four years of 100% annual growth, announced he is retiring as president, but will continue as a senior adviser.



In the world of emulating terminals...
VISUAL is a world apart.

VISUAL EMULATION CAPABILITY

VISUAL 50/55 are low cost smart terminals. The VISUAL 50 emulates DEC VT52*, Lear Siegler ADM3A™ Hazeltine Esprit™ and ADDS Viewpoint™. VISUAL 55 emulates the same plus Hazeltine 1500/1510 and VISUAL 200/210.

VISUAL 102 is 100% compatible with the DEC VT100/VT102™ and also emulates the VT52. A Graphics Option Card provides Tektronix® 4010/4014 compatible graphics.

VISUAL 300/330 are versatile terminals that can be easily customized. The VISUAL 300 emulates the DEC VT100 and VT52. VISUAL 330 emulates the DEC VT52, ADM3A, Hazeltine 1500 and Data General D200.

VISUAL 500/550 are low cost, high resolution graphic terminals with powerful alphanumeric capabilities. The VISUAL 500 emulates the VT52, ADM3A, Hazeltine 1500, D200 and Tektronix® 4010/4014. The VISUAL 550 emulates the VT100, VT52 and Tektronix 4010/4014.

VISUAL terminals feature extended ergonomics including tilt and swivel non-glare 12" and 14" screens, detached keyboard, large character size, menu-style setup, sculptured key caps and more.

VISUAL has earned for itself an exclusive place . . . a solitary niche . . . in the arena of emulating terminals. Four great terminal series offer a combination of advanced features found on no other terminals anywhere in the world. Each series delivers higher performance at lower cost for its particular market segment. And nobody else gives such a wide choice of emulations as VISUAL . . . the pioneer in the field.

So check the chart before you choose your next terminal. See for yourself why VISUAL stands alone as the first choice for emulating terminals.

Service available in principal cities through Sorbus Service, Division of Management Assistance, Inc.

VISUAL See for yourself*

Visual Technology Incorporated
540 Main Street, Tewksbury, MA 01876
Telephone (617) 851-5000. Telex 951-539

*Registered trademark of Visual Technology Incorporated

AEA estimates U.S. export balance disappeared in 1983

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — According to the American Electronics Association (AEA), the already shrinking U.S. export positive balance of trade for electronics and information technology products virtually disappeared in 1983.

Using data derived from the U.S. Department of Commerce, the AEA recently estimated that last year, U.S. electronics exports totaled $26.8 billion, and imports were $26.7 billion, resulting in a positive export trade balance of just $100 million. This compares with a 1980 export balance of $6.3 billion, based on exports of $21.8 billion and imports of $15.5 billion.

Much of the reason for this decline in U.S. export competitiveness is due to the remarkable climb of "second-tier" industrialized countries, which are using their relatively cheap labor costs to attract investment from overseas high-tech manufacturers.

Countries' actions

Following is a synopsis of what some of these countries are doing in their attempts to break through into the information age, based on data supplied by Coopers & Lybrand, the San Francisco-based certified public accountants and consultants.

■ The Hong Kong government is particularly keen to attract foreign investment in new and high-technology industries. Such industries are often able to obtain land leases from the government on favorable terms.

For example, costs of acquiring plant and machinery to undertake scientific research related to the manufacturer's trade or business are fully tax-deductible.

In addition, spending on research and development activities is often tax-exempt, and recently, new rules were introduced which permit tax deductions for expenditures incurred to acquire patents, trademarks and similar rights, to the extent that they are used in connection with income arising in or derived from Hong Kong.

In 1982, the British-administered territory had a gross domestic product (GDP) of $25.9 billion, with Hong Kong's balance of trade with the U.S. amounting to a surplus of $2.6 billion. Economic growth last year is estimated at 5.7%.

■ South Korea has enjoyed spectacular economic growth since the early 1960s, with gross national product (GNP) rising 500% since that time. Today the country is the 10th largest producer of electronics products, with output of such products reaching $4 billion in 1982.

Foreign investment in high-technology fields is welcome and the country has promised to liberalize its trade policies to encourage such investment. For example, high-tech companies may set up a reserve for technology development of up to 20% of taxable income and may take a tax deduction of 10% of expenditures for technology.

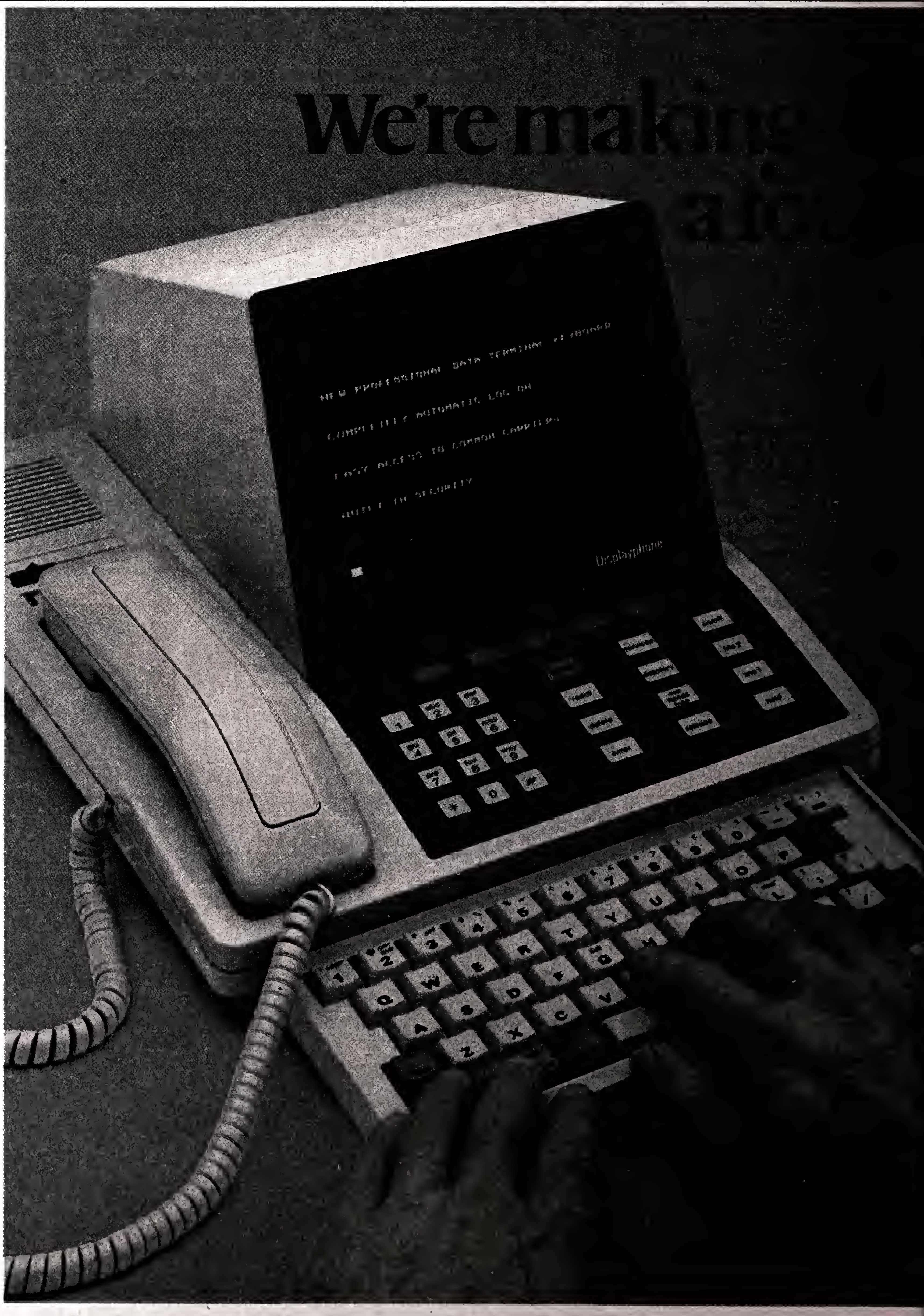
In 1982, the South Korean GNP was $63.5 billion, with exports from Korea to the U.S. totaling $5.6 billion, compared with U.S. imports of $5.5 billion. Economic growth last year is estimated at 7.5%.

■ Singapore, one of the newly industrialized countries of Asia, has participated in the worldwide technological boom by attracting electronic components assembly operations and is now making a determined effort to attract computer equipment manufacturers as well.

A number of financial incentives are offered to high-tech firms, including the Export Financing Scheme — providing long-term loans of up to 10 years at preferential rates to industries requiring high skill levels.

The country's GNP in 1982 was $14.1 billion. Imports to

See **EXPORT** page 152


We're making
a lot
NEW PROFESSIONAL DATA TERMINAL KEYBOARD
COMPLETELY AUTOMATIC LOG ON
EASY ACCESS TO COMMON CARRIERS
BUILT IN SECURITY
Displayphone

'Second-tier' countries seen challenging U.S. vendors

Emerging nations, overseas manufacturing may pose major challenge over next decade

By Robert Batt
CW West Coast Bureau

SANTA CLARA, Calif. — The increasing trend toward overseas manufacturing and the rapid rise of "second-tier" industrialized countries pose a major competitive challenge to U.S. computer manufacturers over the next decade.

This was one of the main themes of a speech here to members of the American Electronics Association (AEA) by Barry Rogstad, chief economist at Coopers and Lybrand, one of the Big Eight accounting firms.

In a wide-ranging overview of global economic issues, Rogstad, a recognized authority in the fields of economic and financial modeling, public policy analysis and international development, said North America, Japan and Europe will face increasing competition in information technology from emerging nations in the Pacific Basin and the Far East, such as Taiwan, South Korea and Hong Kong.

"There is a real shift now taking place in the worldwide production of computer and electronic equipment. International competition will force manufacturers to look for cheaper means of production and, in the U.S., we can expect increasing competition from second-tier countries," he told an AEA seminar on "Improving Profits Through Overseas Operations."

According to Rogstad, this trend is reflected in the latest statistics. While the U.S. trade balance in computer equipment was $6.4 billion in 1981 and $6.2 billion in 1982, this year's figures, he predicted, will show a further drop of .5 billion on the 1982 levels. "Our trade balance in computer equipment is eroding very rapidly," he warned.

Japanese imports

In 1983, the economist continued, imports of computer equipment from Japan were up 113% over the previous year, for South Korea, the figure was 53%, for Taiwan, 97% and for Singapore 263%. "In each case we are talking net imports of $50-$100 million or more," he explained.

In the semiconductor industry, Rogstad noted, while the U.S. had an equitable balance of trade in 1981, this year it is expected to be more than $1.5 billion in the red.

"We are witnessing the internationalization of the production process, where manufacturing is diversified from the developed world into the less developed countries. As legal and trade barriers are eliminated, we are effectively seeing the integration of world capital markets," he continued.

Competition troublesome

In Europe, the competition from the developing world is proving even more troublesome, Rogstad pointed out, with that continent experiencing a decline in its market share for computer products. In the first quarter of 1984, he revealed, Taiwan had replaced the UK as the fifth-largest exporter of goods to the U.S., and he predicted European countries will become increasingly interested in pursuing international joint ventures, mergers and acquisitions.

"Even Japan is seeing an erosion of its share of the international computer market to these second-tier countries in the Pacific Rim," he said. To add to the scenario, Rogstad predicted that in the near term, Latin America would also prove to be a source of competition in the computer industry, particularly Mexico.

See TRADE page 152

playphone terminal
ier to use.

Northern Telecom introduces a new keyboard and other features to simplify data retrieval and transmission.

INTEGRATING VOICE AND DATA...
That's what we're here for.
nt northern telecom

To: Northern Telecom Inc.
P.O. Box 202048, Dallas, Texas 75220
I would like to know more about the Displayphone terminal.
☐ Send me more information.
☐ Have a sales representative contact me. CW-7
Name
Title
Company
Address
Phone
City/State/Zip

STUDY

from page 137

Innovation is the real driving force behind job creation, Birch said, and most innovation in the U.S. is devoted to replacement, rather than expansion.

The MIT study defines innovation as either a new device or procedure — like Visicorp's Visicalc, videocassette recorders or artificial hearts — or the rearranging of existing devices or procedures — Lotus Development Corp.'s 1-2-3 electronic spreadsheet program, Federal Express Co. or automated teller machines.

Not all innovation is driven by technology, the study noted. World events also play a role, such as the 1974 Arab oil embargo, which prompted a growth in coal mining and railroad transportation of that coal. Other innovation is spurred by demographic or market factors, with health care and colleges serving as examples in this area, according to the study.

"While terribly disruptive to many local communities and families and trade unions, it is this replacement form of innovation that keeps the U.S. competitive in world markets and that provides the advanced products and services required to support the remaining, primary job-creating segment of the economy," the study stated.

The MIT study said high technology is one of the 15 most innovative sectors of the economy. Others include coal mining, department stores, petroleum refining and household appliances.

The study stated that it would be irresponsible for the nation not to devote significant resources to high technology. But it was critical of state and local governments' efforts to lure high-tech companies to their communities.

"Most places do not have the strong, research-based universities, the highly skilled, technical work forces and the years of technical tradition that produce bankers and lawyers and venture capitalists and professors who understand [high technology] well and support it," the study stated.

"It is not an accident that five states house almost 60% of all high-innovation jobs, and that 10 states house over 80% of these jobs."

Although innovation offers abundant opportunity for U.S. industry, the potential problems should not be overlooked, according to the study. "As we replace the old with the new, we threaten and devalue the old — the old factory, the old company and, most importantly, the older or obsolete worker. Our challenge is to be as creative in dealing with the human and physical consequences of innovation as we have been in producing it," the study concluded.

The study was funded by a consortium organized by the Small Business Foundation of America, Inc., including the National Venture Capital Association, the Charles Stewart Mott Foundation, the National Association of Small Business Investment Companies and the American Stock Exchange. The report is available from the Small Business Foundation of America, 84 State St., Boston, Mass. 02109.

DAISYWHEEL • DOT MATRIX • THERMAL

FUJITSU PRINTERS

You can't buy more Performance for the Price.

Finally, there is a full line of quality printers available to meet a variety of needs. And all from a single manufacturer... FUJITSU. From dependable dot matrix printing to advanced thermal printing, you can't buy more performance for the price.

Quality That's Built In: Fujitsu quality is built into every printer manufactured. That quality translates into high reliability (MTBF), versatile print capability, low maintenance, low noise, and high speeds. And Fujitsu printers are serviced by TRW, a nationwide service organization.

A Complete Printer Line: Fujitsu's dot matrix printer, with its 24 wire head, offers letter quality printing at 80 CPS. With its ability to also produce draft quality, correspondence quality and high resolution graphics, the Fujitsu DPL24 leads dot matrix technology.

In daisy technology, Fujitsu's SP830 is the fastest letter quality printer in the industry at 80 CPS. Fujitsu's SP320 daisywheel printer also provides cost effective letter quality printing at medium speeds. Fujitsu offers thermal printing with its TTP16 printer. The low-cost printer accepts a wide variety of papers and operates quietly at less than 50 dBA.

Call Us Today: Contact Fujitsu America, Inc., at 408-946-8777 for the printer distributor nearest you.

DISTRIBUTORS: Algoram Computer Products (415) 969-4533, (714) 535-3630, (206) 453-1136, (916) 481-3466; Allen Edwards Associates, Inc. (213) 328-9770, (714) 552-7850, (619) 273-4771, (805) 498-5413; Four Corners Technology (602) 998-4440, (505) 821-5185; Gentry Associates, Inc. (305) 859-7450, (305) 791-8405, (813) 886-0720, (404) 998-2828, (504) 367-3975, (205) 534-9771, (919) 227-3636, (803) 772-6786, (901) 683-8072, (615) 584-0281; Hopkins Associates, Inc. (215) 828-7191, (201) 273-2774; Inland Associates, Inc. (913) 764-7977, (612) 343-3123, (314) 391-6901; Logon, Inc. (201) 646-9222; Lowry Computer Products, Inc. (313) 229-7200, (216) 398-9200, (614) 451-7494, (513) 435-7684, (616) 363-9839, (412) 922-5110, (502) 561-5629; MESA Technology Corp. (301) 948-4350; NACO Electronics Corp. (315) 699-2651, (518) 899-6246, (716) 233-4490; Peak Distributors, Inc., (An affiliate of Dytec/Central) (312) 394-3380, (414) 784-9686, (317) 247-1316, (319) 363-9377; R² Distributing, Inc. (801) 298-2631, (303) 455-5360; S&S Electronics, (617) 458-4100, (802) 658-0000, (203) 878-6800, (800) 243-2776; USDATA (214) 680-9700, (512) 454-3579, (713) 681-0200, (918) 622-8740.

PERIPHERAL PRODUCTS DIVISION

Quality Lives

FUJITSU

EXPORT

from page 150

Singapore from the U.S. totaled $3.6 billion, compared with domestic exports to the U.S. of $2 billion. Economic growth in 1983 was estimated at 4%.

■ The government in Taipei has sought to attract high-tech manufacturers through a combination of tax and other incentives. Such manufacturers, for example, may qualify for a reduced tax rate of 22%, compared with corporate income tax rates of up to 35%.

Computer manufacturers are often offered a five-year tax holiday that they may postpone for up to four years when sales and income usually have increased.

Taiwan's GDP in 1982 reached $46.5 billion. The country had a favorable balance of trade with the U.S. of $4.2 billion and is currently the fifth most important exporter to the U.S. Economic growth in 1983 was approximately 5.5%.

TRADE

from page 151

However, he stressed, while the balance of trade in computer-related industries has been shifting away from the industrialized nations, U.S. manufacturers still have significant competitive advantages, not least of which is ready access to the world's largest computer and electronics market — the U.S.

To take advantage of overseas business expansion and international trade, it is therefore critical, he maintained, that domestic manufacturers make the required investments in technology and the training of manpower to enable them to meet the challenge of overseas competition.

We are not at the end of a transition period, Rogstad concluded. Rather, the current trends are a precursor of future transitions to come and, as such, the development of computer engineers, electronics engineers and systems analysts is critical to the future of the U.S. information processing industry.

The new model IBM System/36. The big news is that we made it smaller.

As you can see, this new IBM System/36 processor is about the size of a two-drawer file cabinet. Yet it has the power of the larger System/36. Easy to install, easy to use, it's ideal for a company's departments or remote locations.

This System/36 processor—the 5362—integrates data processing, text processing and color business graphics. It runs all the System/36 applications without recompiling. And the wide range of available proven software packages satisfy almost every user's needs.

The new 5362 processor has up to 512K of main memory and from 30MB to 120MB of disk storage. It can support up to 22 local work stations and up to 64 remote units, including the IBM Personal Computer and the PC/XT. And any System/36 communicates with a range of IBM small and large computers.

The new System/36 processor just plugs into any 110v outlet. Additional features or memory can be added by inserting plug-in modules. And its more than 2,000 "Help" screens will lead a user through any rough spots.

Another new System/36. A lot of computing power in a small package. But the best news isn't what's in the computer, it's also what's on the computer. IBM.

This new system is available from your IBM representative or from an IBM System/36 Value Added Remarketer. Or for more information, call 1 800 IBM-2468, ext. 449.

IBM®

MPG

from page 137

flagship Ramis II product contains some inherent inefficiencies. For one thing, the product has not provided for concurrency or reentrance until the latest release. These features are only required in about 25% of the applications in most DP shops, but are "very visible," according to Frank Fish, MPG's vice-president and director of international operations.

Toward that end, MPG is focusing on DBM, a subset of Ramis II that it announced last year but has yet to ship commercially. DBM is basicaly a hierarchical DBMS with relational-like logical user views, according to Bernard J. Finzi, senior vice-president and director of technical services. It is designed to compete directly with large-scale DBMS such as Cullinet Software, Inc.'s IDMS and Software AG of North America, Inc.'s Adabas.

"We believe you can have one integrated product that serves all the needs of DP," said MPG President Richard Cobb. He added that DBM "will have no impact at all on people using Ramis II for unstructured problems. But it will open Ramis II up to a whole new host of demands."

Nevertheless, convincing a skeptical market will be a big task. MPG executives admit that the fourth-generation label is a millstone around the company's neck as it tries to climb onto the DBMS plateau. Also, the DBMS competition is already firmly entrenched in many customer sites. In general, it is easier to sell a productivity aid as an add-on to a DBMS than to do it the other way around.

Still, MPG believes it will prevail by virtue of its head start in the ease-of-use area. For example, Ramis II offers a three-level user interface ranging from a natural query language called English to a menu-driven front end to the more complex Ramis II commands. By building the DBMS under the interface, MPG can provide an attractive mix of flexibility and power, even if the product would not beat the larger competitors in flat-out processing speed, Cobb said. DBM is also designed to use existing data from IDMS; IBM's IMS, DL/1 DBMS and Vsam files; Adabas; and Cincom Systems, Inc.'s Total.

Cobb argued that traditional DBMSs are ill-suited for the decision support-type applications that are becoming increasingly critical to businesses. Hanging user-friendly on-line interfaces on batch-oriented DBMS dramatically weakens their efficiency, he said. "The fact that a drag race car can move fast on the straightaway doesn't make it suitable for the Indianapolis 500," he commented.

But that doesn't change the fact that MPG must try to penetrate a market that is dominated by respected and aggressive competition. The company will try to increase its visibility this year with a more forceful advertising campaign and clearer communication of its strategies. It will also expand its product line and attempt to emphasize the range of components that make up Ramis II, rather than focusing on a single product. However, Cobb conceded MPG's biggest obstacle may be "cutting through all the noise" of the data base industry in an effort to change Ramis II's image.

NICKELS

from page 148

sociated loss in the current quarter, coupled with record bookings and backlog, stem from a combination of the revision in sales recognition criteria and a continuing shift to longer-term and larger, more customized orders, which extends the time from receipt of order to shipment.

■

Object Recognition Systems, Inc. announced revenues for the first quarter ended March 31 of $386,721, compared with $23,785 for the previous year. Net loss was $1.1 million, or 29 cents per share, compared with a net loss of $747,193, or 25 cents per share, one year earlier.

■

Micom Systems, Inc. reported revenues for the fiscal year ended March 31 increased 57% to $132.5 million. Profits increased 54% to $20.7 million, or $1.34 per share.

For the fourth quarter, profits were $42.2 million, an 80% increase over the same period last year. The quarter's revenues rose 62% to $6.2 million, or 40 cents per share.

■

Intelligenetics reported revenues for the nine months ended March 31, were $1.4 million, an increase of 277% over the same period last year. Net losses were $830,000.

Revenues for the quarter ended were $497,000, an increase of 196% over the prior year. Net losses were $390,000.

The company also announced a name change from Intelligenetics to **Intellicorp.**

■

United Telecommunications, Inc. reported to the Securities and Exchange Commission that it has aquired 2,870,900 shares of the common stock of the Southern New England Telephone Co.

■

Computer Associates International, Inc. announced revenues for the fiscal year ended March 31 were $84.7 million, compared with $58.1 million for the previous year. Profits were $9.3 million, or 90 cents per share, compared with $5.4 million, or 64 cents per share, one year earlier.

For the the fourth quarter, revenues were $24.2 million, compared with $16.2 million for the same quarter a year earlier. Profits were $2.6 million, or 25 cents per share, compared with $1.7 million, or 20 cents per share, for the same period in the previous year.

THE BEST WAY TO REACH MEN WITH YOUR NETWORK BUDGET IS TO SPEND PART OF IT ON ESPN, THE TOTAL SPORTS NETWORK.

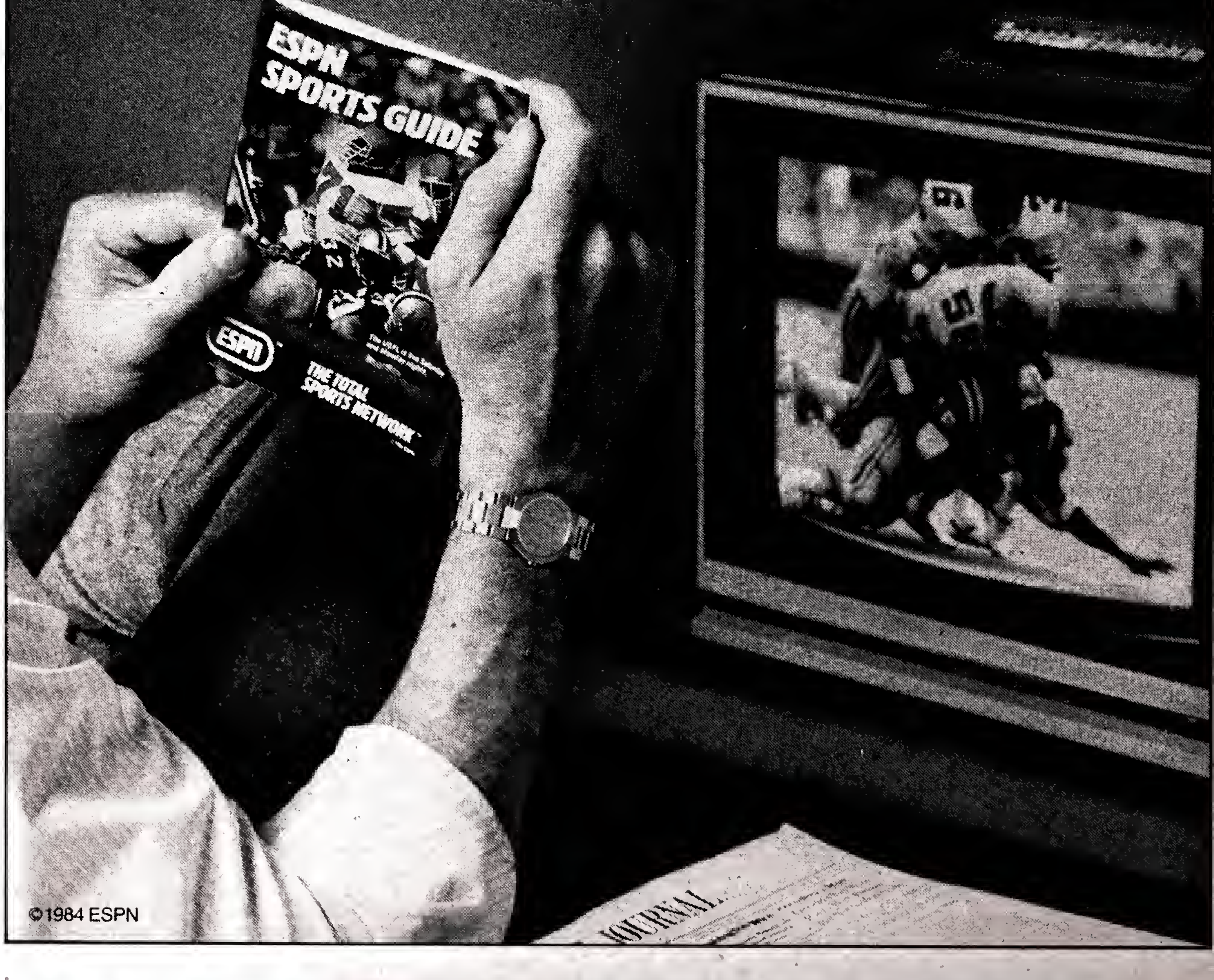
Put 10% or more of your network budget on ESPN, and we'll give you back two men for the price of one on the networks. And up-scale men at that.

Because no one captures and holds a man's attention like ESPN. Not even the networks. Perhaps that's why network TV's share of the male audience has declined 33% overall since 1979 (although you wouldn't know it by the 40% increase in network prime time rates).

Discover how ESPN can help you get more good men for your money. Contact Jack Bonanni, V.P. Advertising Sales at (212) 661-6040. He'll even have Nielsen tabulate your original network plan and compare it to network/ESPN combination plan for any month representative of your annual network schedule. Network television advertising doesn't have to be inefficient. Not when it includes the total sports network. ESPN.

ESPN™

THE TOTAL SPORTS NETWORK™



©1984 ESPN

Protect your microcomputer from blackouts, brownouts and power-line noise.

☑ I'D LIKE TO KNOW MORE ABOUT THE POWERMAKER® MICRO UPS.

☐ Please send me a free brochure.
☐ Please have a salesman call.

Name________________________________
Title_________________________________
Company____________________________
Address_____________________________
City__________ State_____ Zip_______
Phone (____)________________________

Please indicate your application
☐ End-user ☐ OEM ☐ Reseller

TOPAZ™
SQUARE D COMPANY

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 8135 SAN DIEGO, CA

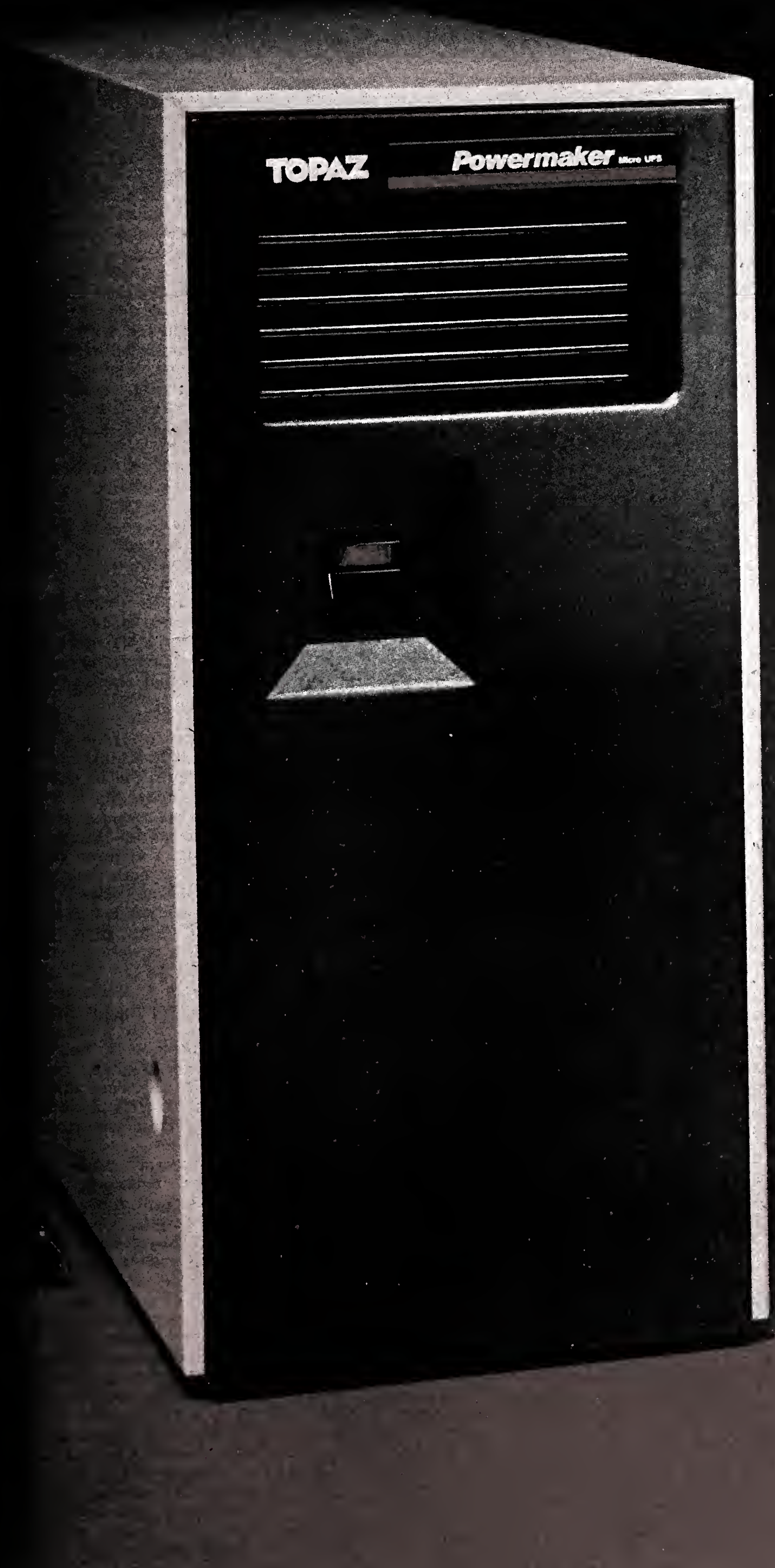
POSTAGE WILL BE PAID BY ADDRESSEE

TOPAZ
9192 Topaz Way
San Diego, CA 92123-9975

Only from Topaz...

Powermaker® Micro UPS

Uninterruptible, computer-grade power —at half the cost



It's in a class by itself.

For about half the cost of other Uninterruptible Power Systems, you can now get the same degree of protection with our Powermaker Micro UPS. This remarkable new system eliminates computer problems caused by blackouts, brownouts, voltage sags and power-line noise.

Providing up to 75 minutes of continuous computer-grade power, our Powermaker Micro UPS is compatible with microcomputers and PC's. It's fully automatic, maintenance-free, portable and compact. It fits neatly alongside or under your desk or workstation. And because you can't always tell when you've lost primary power, our little UPS even features an audible line-loss alarm.

But best of all is the price. The Powermaker Micro UPS is priced right and is ready for immediate shipment. Find out more about our Powermaker Micro UPS. Call us at (619) 279-0831, or contact your local Square D distributor.

TOPAZ®

Excellence in Computer Power

SQUARE D COMPANY

IBM from page 137

an Economic Commission (EEC) recently over the supposedly pending EEC antitrust action against IBM.

Opel, speaking to the American Chamber of Commerce in London, said "this kind of action could be taken against the leader of any industry." But just what other industry has a dominant leader comparable with IBM? Most other international conglomerates tend to be diversified, gathering their huge amounts of money from a variety of industries; IBM is concentrated in the information industry.

Because of its unique prominence, IBM undoubtedly faces unique treatment in future years as various countries and socioeconomic groups strive to keep a piece of the pie for themselves.

It's really tough being so successful.

Computervision, Metheus form venture

NEW YORK — Computervision Corp. and Metheus Corp. last week announced formation of a joint venture to design and develop electrical computer-aided engineering (CAE) workstation products.

The venture, Metheus-CV, Inc., will be headquartered in Hillsboro, Ore., and Metheus President James C. Towne will become president and chief executive officer of the new venture, a company spokesman said. Metheus, which is headquartered in Hillsboro, will have a majority interest in the joint venture initially, but Computervision reportedly has the option to acquire a majority interest over time.

Under the terms of the agreement, both companies will contribute financial resources to the venture and will combine electrical CAE technology and development resources. Plans call for development of computer-aided engineering, design (CAD), test and manufacturing (CAM) products for a variety of integrated circuit and circuit-board design applications.

BANK from page 137

BWCS' expertise and our data base and personal computer software technology, we will be able to provide a state-of-the-art fully integrated solution to the banking industry with the Cullinet Banking System."

Cullinet said its banking system will comprise five modules: deposits, loans, customer information system, electronic banking and portfolio management. Current products offered by BWCS include systems for on-line banking, loan account management, credit card account management and deposit account management.

Analysts characterized the agreement as an aggressive move by Cullinet to match its data base expertise with applications for the banking market.

Curt A. Monash, an analyst with Paine Webber Mitchell Hutchins, Inc., said the acquisition is certain to affect financially successful Hogan Systems, Inc. and other second-tier vendors of banking software. Monash noted that both Cullinet and Management Science America, Inc. both "have clearly indicated their desire to approach a variety of vertical markets."

George S. Mellman, a senior consultant for financial services with International Data Corp. of Framingham, Mass., said Cullinet now "is going in the same direction Hogan says [it is] going in. . . . There is an enormous market out there."

IDC recently reviewed the banking software market [CW, June 4] and cautioned that, despite its financial success, Hogan had yet to install a complete banking "supersystem" to demonstrate its claims.

Monash said the top tier of vendors includes IBM, Cincom Systems, Inc., Applied Data Research, Inc. and Cullinet. The "second tier," he said, would include Hogan, Anacomp, Inc., "and [BWCS] might be included in a list of six." Both Hogan and Anacomp have been aggressively attempting to develop what they call fully integrated banking systems.

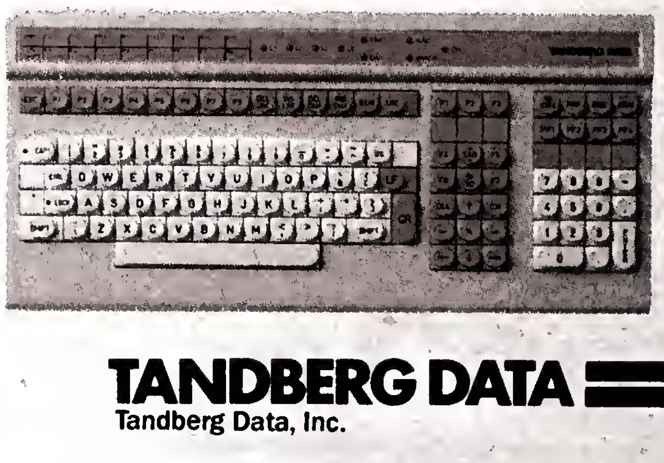
A lot of terminal manufacturers have tried to copy our ergonomic design
...It will be a lot tougher to copy our performance

In 1980 when Tandberg Data introduced the TDV 2200 family, they were the first and only terminals in the world meeting the stringent specifications of the 1985 German Ergonomic Standard... a standard set to protect the safety, health and comfort of the operator. The TDV 2200 includes such features as tilt, swivel, height adjustment, ultra-low profile, detachable keyboard for comfort of operation, non-reflective surfaces, and anti-reflex tube for screen clarity. Since its introduction and as a testimonial to its innovative design, over 50,000 units have been installed.

Today, there are a lot of "me-too" terminal manufacturers who have tried to copy our ergonomic design and that's certainly a plus for the industry. But, with our new TDV 2200S, an even improved version, it will be a lot tougher to copy our performance.

The TDV 2200S can emulate virtually any popular terminal and protocol. It can be equipped with up to 56k bytes of memory and some models will store up to eight pages of data. It has superb communications capabilities including networking; up to 1024 different characters in a single terminal; optional high resolution business graphics; a 70Hz refresh rate for flicker-free viewing; and a 15" screen and big letters for easy readability.

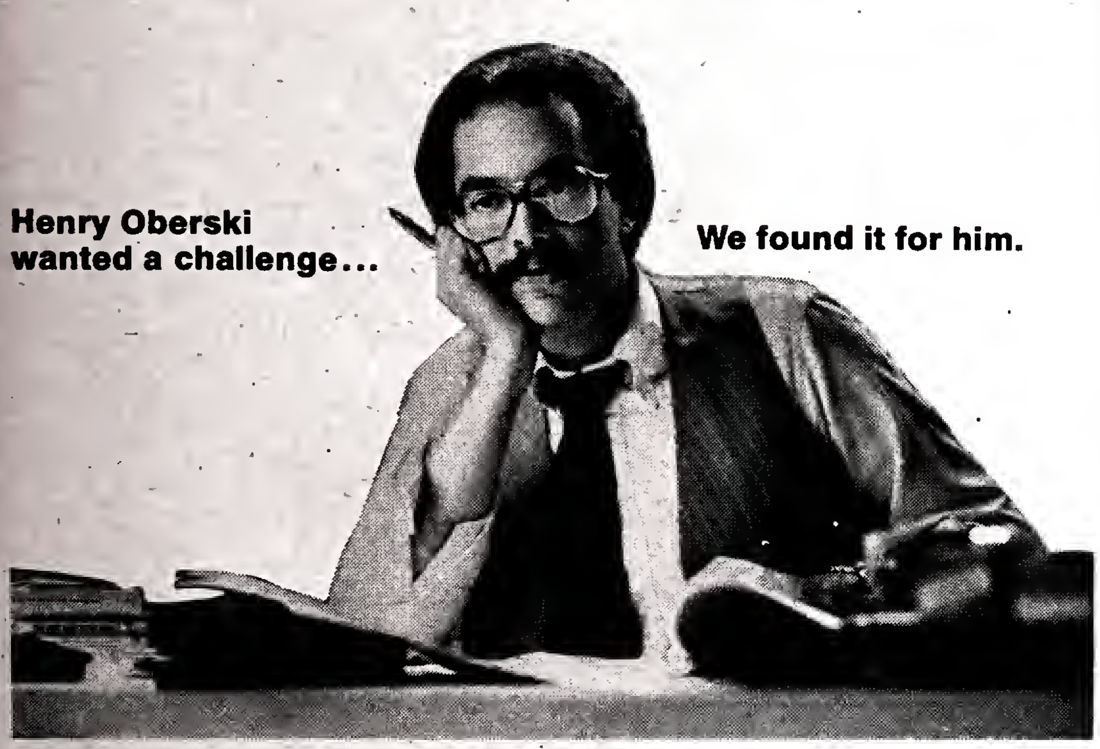
Like its predecessor, the TDV 2200S also features sixteen soft switches called PUSH keys that recall previously stored words, phrases or code sequences; a simplified menu protocol that cuts set-up time in half; and character, page, block or line/field transmission. No other terminal on the market today can match all of these features. But, they are probably trying.



So, you can wait while they try to catch up with us, or you can go with the terminal that sets the pace for the industry. Tandberg Data, Inc., P.O. Box 99, Labriola Court, Armonk, N.Y. 10504. Phone: (914) 273-6400. Telex: 137357 Tanberg Arnk.

TANDBERG DATA
Tandberg Data, Inc.

POSITION ANNOUNCEMENTS



Henry Oberski wanted a challenge...

We found it for him.

Henry Oberski had been in the data processing field for a number of years before he first came to us. His education was most impressive. His EDP experience was extensive, to say the least. The problem was that, over the years, Henry had provided solutions to dozens of various challenges. He was, as a result, becoming bored with his work.

Henry was quite specific about what he wanted to do and that, indeed, became a real challenge to us. We had nothing immediately available to meet his requirements. So, we made a tremendous number of client contacts and, in time, we found a challenge that was the peak in Henry's professional life. Now he's happy and we're happy for him.

So, you see, NCA is not limited to routine placement services. Career advancement... we do it all... and no one does it better. Come in. Call. Or mail your resume to the NCA firm nearest to you. Confidentiality is assured. Company clients assume our fees.

ATLANTA: BAI Limited
3475 Lenox Road N.E., Suite 490-C
Live Oak Center
Atlanta, Georgia 30326 (404) 231-4545

BOSTON: Robert Kleven and Co., Inc.
North Brook Park, Suite One, 181 Bedford Street
Lexington, Massachusetts 02173 (617) 861-1020

CHICAGO: Thos. Hirtz & Associates
150 N. Wacker Drive, Suite 1700
Chicago, Illinois 60606 (312) 977-1555

COLUMBUS: Michael Thomas, Inc.
65 E. Wilson Bridge Road, Suite 201
Worthington, Ohio 43085 (614) 846-0926

DALLAS: DataPro Personnel Consultants
12720 Hillcrest, Suite 520
Dallas, Texas 75230 (214) 661-8600

DETROIT: Electronic Systems Personnel, Inc.
3000 Town Center, Suite 2580
Southfield, Michigan 48075 (313) 353-5580

FLORIDA: Data Sciences Personnel, Inc.
P.O. Box 8577
Hollywood, Florida 33024 (305) 434-6112

HARTFORD: Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105 (203) 549-4240

HOUSTON: Career Consultants, Inc.
2000 South Post Oak
Houston, Texas 77056 (713) 626-4100

INDIANAPOLIS: Career Consultants
107 N. Pennsylvania, Suite 404
Indianapolis, Indiana 46204 (317) 639-5601

KANSAS CITY: D. P. Career Associates
6405 Metcalf, Suite 502
Shawnee Mission, Kansas 66202 (913) 236-8288

LOS ANGELES: Superior Resources, Inc.
Personnel Service
17141 Ventura Boulevard, Suite 200
Encino, California 91316 (213) 986-4400

Call the NCA firm nearest to you for
Salary Survey and Relocation Information

MILWAUKEE: EDP Consultants, Inc.
7332 West State Street, Suite 3
Milwaukee, Wisconsin 53213 (414) 475-0077

MINNEAPOLIS: Electronic Systems Personnel
858 Twin City Federal Tower, 121 S. 8th St
Minneapolis, Minnesota 55402 (612) 338-6714

NEW JERSEY: Systems Search
90 Millburn Avenue
Millburn, New Jersey 07041 (201) 761-4400

NEW YORK: Botal Associates, Inc.
7 Dey Street, Suite 410
New York, New York 10007 (212) 227-7370

NEW YORK UPSTATE:
CFA Associates Personnel, Inc.
2530 James Street
Syracuse, New York 13206 (315) 463-5225

NORTH CAROLINA: DataMasters,
Div. of TaskForce, Inc., P.O. Box 6888
Greensboro, North Carolina 27405
(919) 373-1461

PHILADELPHIA: Systems Personnel, Inc.
115 West State Street
Media, Pennsylvania 19063 (215) 565-8880

PHOENIX: Professional Career Consultants
4628 North 17th Street, Suite H101
Phoenix, Arizona 85016 (602) 274-6666

PITTSBURGH: Mortell, Liguore & O'Brien, Inc.
P.O. Box 836
Allison Park, Pennsylvania 15101 (412) 487-5153

SAN FRANCISCO: The Computer Resources Group,
Inc. Agency, 303 Sacramento Street
San Francisco, California 94111 (415) 398-3535

SEATTLE: Houser, Martin, Morris & Associates
1940 116th Avenue N.E.
Bellevue, Washington 98004 (206) 453-2700

WASHINGTON D.C.: ESP Systems Corporation
914 Lamberton Drive
Silver Spring, Maryland 20902 (301) 649-6171

National Computer Associates

EDP Placement Firms in Baltimore, Cleveland and St. Louis can learn about the many advantages of being members of National Computer Associates by calling Jack Todd (602) 274-6666

Program Manager

Small Computer Software

We are looking for a seasoned Program Manager to build a business with a new generation of energy software for small computers.

You must have an excellent track record in new product introduction and management and be a self-starter with experience in marketing, management and development of small computer software. B.S. (Engineering) preferred. You'll need good communications skills and some travel is required.

We offer excellent company paid benefits. Please send your resume, including salary history to:

J.D. Goodyear
Employment, C11
P.O. Box 736
Idaho Falls, Idaho 83401

Energy Incorporated is an
Equal Opportunity Employer M/F/H/V

ENERGY INCORPORATED

Applications Programmer

Sought by MIT's Department of Electrical Engineering and Computer Science to write graphic and computational programs for use in teaching two major department undergraduate field theory subjects: "Electromagnetic Fields and Energy", and "Electrodynamics". Will maintain the system of programs, write documentation and provide consulting assistance to students and faculty. This work is part of MIT's Project Athena and will be conducted on a VAX 11-750 system running UNIX. Experience in as many of the following areas as possible required: computer graphic systems; symbolic manipulation systems (e.g. MACSYMA); Berkeley UNIX; and skill at numerical field computations.

Send 2 copies of resume, ATTN: Job No. C84-113, to: MIT Personnel Office, 77 Massachusetts Avenue, E19-239, Cambridge, MA 02139. MIT is an equal opportunity/affirmative action employer.

MIT

PROGRAMMER/ANALYSTS

SYSTEM/38 RPG/CL
SERIES I EDX/EDL
IBM PC

Fast-growing company in rural country setting needs several experienced programmer/analysts for development of manufacturing, retail, publishing and other systems. The successful candidates will have 1 or more years hands-on experience on one or more of the systems named above, and 3 or more years data processing application development experience. Principals only, please.

Please send resume and salary requirements to:
MIS DIRECTOR
RENOVATOR'S SUPPLY, INC.
MILLERS FALLS, MA 01349

Now You Can Join a Company as Good as You Are

You've reached the pinnacle of your technical talent. And now you're ready to explore new things, to expand your knowledge of the state-of-the-art . . . and your career. To do this, you need a company that can foster your intellectual curiosity. You need a company that's as good as you are.

YOU NEED M/A-COM DCC.

M/A-COM DCC is a world leader in the telecommunications industry, recognized for the excellence of the data, satellite, and lightwave products we design, develop and manufacture. As a part of M/A-COM, Inc., a Fortune 500 company, we are experiencing all the corporate-wide growth our leadership position commands.

Now we are seeking top-notch technical professionals to join us in the one of following positions:

SOFTWARE ENGINEER

Sr. Principal Engineer

This is a highly technical position that requires a theoretical background tempered with practical design and implementation experience. We seek a technical specialist to specify, design, and implement packet switching and distributed microprocessor network software.

You must have a BS or MS in Electrical Engineering or Computer Science with 10-15 years experience with real-time software, packet-switching, protocols (especially X.25), and network design. You will also perform software design, code and test, software quality and configuration control.

VAX SYSTEMS SPECIALIST

You must possess systems experience on VAX/VMS internals and the ability to evaluate various business and database management systems on VAX/VMS. Responsibilities include systems support and design including networking and performance optimization; also selection of a database management system for VAX/VMS on which future corporate business systems will be based.

This position requires you to have either a BSCS or MSCS; 3-5 years experience on VAX/VMS; 3 years experience with business systems on VAX/VMS; expertise in COBOL and DBMS systems on VAX; familiarity with one or more DBMS systems available for VMS, (e.g. VAX DBMS, Ingres and Oracle). Additionally, you must have experience implementing a minimum of one major business system on VMS (Payroll, Personnel or Materials Management). Experience in VAX system management a plus.

M/A-COM DCC offers top salaries, excellent company-paid benefits and a truly professional work environment. Now is your time to work for a company as good as you are. Send your resume in complete confidence to: SUSAN MORALES, M/A-COM DCC, Inc., 11717 Exploration Lane, Germantown, MD 20874. Or call collect (301) 428-5674. An equal opportunity employer. U.S. citizenship is required.

M/A-COM DCC

Programmers

The Great Atlantic & Pacific Tea Company, Inc., an expanding retail organization, has openings for programmers to work in our IBM shop running under DOS/VSE environment utilizing SNA. Our main programming language is COBOL with a significant percentage of our development being under CICS. Ideal candidates will be degreed with a minimum of 2 years experience, looking to work in a rapidly expanding, challenging atmosphere.

Openings exist in both our development and systems programming areas.

If you wish to further your career submit your resume to: **C. Blake, The Great A&P Tea Co., Inc., 2 Paragon Drive, Montvale, NJ 07645.** Qualified applicants will be contacted promptly. We regret that we cannot accept phone calls, nor pay agency fees. An equal opportunity employer.

PHILADELPHIA

We have been retained to recruit exclusively for well-known Phila area corp offering exciting new project development oppty. Paid relocation and excellent benefits. Our client seeks:

SOFTWARE ENGINEER TO $55,000 COMMUNICATIONS SOFTWARE

BSEE, COMPSCI, or Physics with several years software devel exp using either ASSEMBLY, FORTRAN, PASCAL. Knldg data communications, networking, protocols reqd. Graphics software exp ideal. Command & control systems exp +. Intving now.

ROBERT HALF
OF PHILADELPHIA, INC.
2000 Market St., Suite 706
Philadelphia, PA 19103
(215) 568-4560

SUNBELT OPPORTUNITIES

DANIEL INTERNATIONAL is one of the largest engineering, construction and maintenance firms in the nation. We currently have a need for the below listed individuals in our information systems division at our corporate data center located in Greenville, SC.

SYSTEMS ANALYST

Will support development and installation of computerized maintenance management systems at client locations. Participate in ongoing support of the systems and of the sales efforts. Experience should include applications background and preventive/predictive maintenance, inventory control, work order systems and maintenance planning. Any On-line data base experience and a working knowledge of a variety of hardware is desirable. Individual's personality should be client, entrepreneur and solution oriented. Positions will entail up to 50% travel to include possible international travel.

PROGRAMMERS

Positions will require a minimum of 1 year COBOL and/or RPGII programming experience. Additional experience in IDMS, Data Base and CICS On-line preferred. Also desire background in JCL and IBM OS/VS1 or MVS utilities. Exposure to TSO/SPF and PANVALET a plus.

SYSTEMS PROGRAMMER

Desired qualifications include: 2-3 years OS systems program experience; Knowledge of data communications protocols; Prior CICS/VS installation experience; Knowledge of VTAM, SMP, IBM3705 and NCP.

MINI/MICRO TECHNICAL SPECIALIST

Desired qualifications include: Computer Science degree with technical orientation or 1-2 years experience in Mini/Micro technical support; Knowledge of communications protocols (ASYNC/SNA); Prior technical experience with IBM-PC including hardware, software and attachments; Knowledge of compilers, assembly language, operating systems, device drivers and I/O routines.

In addition to a nationally competitive salary structure, we offer many improved benefits. These include short-term disability, salary continuation, accidental death coverage, medical insurance and corporate profit sharing.

If you are looking for a new career and meet the above requirements, please send your resume in complete confidence to:

Alan Bean
DANIEL CONSTRUCTION COMPANY
Daniel Building
Greenville, SC 29602
(803) 298-2441

DANIEL

We Are An Equal Opportunity Employer

International Organisation in Luxembourg seeks:

a DATA BASE MANAGER

with University degree or equivalent; at least 3 years experience as Data Base Manager; IBM VM/VSE familiarity. Prefer CINCOM TOTAL experience.

an ANALYST/PROGRAMMER

DOS/VSE COBOL and/or CINCOM TOTAL/COBOL-XT experience preferred.

Must have:

- **The nationality of a NATO member country**
- **A good knowledge of English or French and the ability to read and comprehend the other.**

International status. Tax free emoluments.

Application and detailed curriculum vitae should be sent, quoting reference AO/4/84 to:

The Chief Personnel Division
NATO SUPPLY CENTER
B.P. 13
L-8301 CAPELLEN
Grand Duchy of Luxembourg

CURIOUS ABOUT CLASSIFIED?

If you are interested in advertising with Computerworld, but don't know how to do it, give us a call! We will be glad to send you our current rate card, which explains sizes, costs, deadlines and requirements. All you have to do is ask! Our toll free number is 800-343-6474, in Massachusetts call (617)879-0700, just ask for the Classified Advertising Department. Or, you can look for our classified order form located in the classified section of Computerworld. Fill it out, attach your ad with a check, and return it to us. Computerworld Classified Advertising, 375 Cochituate Rd., Box 880, Framingham, MA 01701. We're anxious to help!

A Perfect Fit

nd the right position from over 500 others listed in our new, pocket-size *Digest of Computer Opportunities.* It's FREE!

$ 0,000–$105,000

urce Edp has an easy, new way to evaluate computer position oppor- unities in any area or salary range u wish to explore.

called the **Digest of Computer rtunities.** It's new . . . and it's ely free just by calling or writing your own personal copy.

s more convenient and comprehensive

Digest gives you a timely and com- report of our client's current in programming, systems analy- software development and support, gement consulting, marketing marketing support and all levels of ter and information systems gement. You'll see how you can state-of-the-art exposure in just any discipline you'd like to explore.

Digest is organized geographically you can evaluate openings in your town or city. Or anywhere else North America. Specific salaries, onsibilities, experiences needed more are covered for every career ing. In all, over 500 positions are wed in this 48-page report.

Best of all, it's free

Source Edp for your free copy. the leading recruiting firm that cializes in the computer field, can provide expert assistance never you feel you would like to uate your career. Our professional is comprised entirely of people ing extensive computer back- unds. So you will always get nd advice in selecting the best path alternatives. And, of urse, there is never any obligation expense to you since our client panies assume our charges.

u're looking for a new ortunity—or merely want to what other kinds of positions are ilable and at what salary ranges— l or write for your copy of the Digest.

s the perfect way to explore in mplete confidence.

Call today

Call the Source Edp office nearest you for a free copy of our **Digest of Computer Opportunities.** We'll mail a copy to you in strict confidence, without obligation.

If unable to call, write:

Source Edp
Department CD1
P.O. Box 7100
Mountain View, CA 94039

When writing, please include your title.

Alabama	
Birmingham	205/322-8745
Arizona	
Phoenix	602/279-1010
Tucson	602/792-0375
California	
Northern	
Mountain View	415/969-4910
Sacramento	916/446-3470
San Francisco	415/434-2410
Walnut Creek	415/945-1910
Southern	
Fullerton	714/738-1313
Irvine	714/833-1730
Los Angeles/ Downtown	213/688-0041
Los Angeles/ South Bay	213/540-7500
Los Angeles/West	213/203-8111
San Diego	619/231-1900
San Fernando Valley	818/781-4800
Colorado	
Denver	303/773-3700
Connecticut	
Danbury	203-797-0590
Hartford	203/522-6590
New Haven	203/787-4595
Stamford	203/967-4888
Stratford	203/375-7240
Waterbury	203/574-5633
District of Columbia	
Washington D.C.	202/293-9255
Florida	
Fort Lauderdale	305/491-0145
Jacksonville	904/356-1820
Miami	305/624-3536
Georgia	
Atlanta/Downtown	404/588-9350
Atlanta/North	404/953-0200
Illinois	
Chicago/E. Loop	312/565-1400
Chicago/W. Loop	312/346-1280
Oak Brook	312/986-0422
Rolling Meadows	312/392-0244
Indiana	
Fort Wayne	219/432-7333
Indianapolis	317/631-2900
Iowa	
Des Moines	515/243-0191
Kansas	
Overland Park	913/888-8885
Wichita	316/688-1621
Kentucky	
Louisville	502/581-9900
Louisiana	
Baton Rouge	504/924-7183
New Orleans	504/561-6000
Maryland	
Baltimore	301/727-4050
Greenbelt	301/441-8700
Towson	301/321-7044
Massachusetts	
Boston	617/482-7613
Burlington	617/273-5160
Springfield	413/739-4083
Wellesley	617/237-3120
Michigan	
Detroit	313/259-7607
Grand Rapids	616/459-6539
Lansing	517/484-4561
Southfield	313/352-6520
Troy	313/362-0070
Minnesota	
Minneapolis/West	612/544-3600
Downtown	612/332-6460
St. Paul	612/227-6100
Missouri	
Kansas City	816/474-3393
St. Louis	314/862-3800
Nebraska	
Omaha	402/346-0709
New Hampshire	
Nashua	603/880-4047
New Jersey	
Cherry Hill	609/482-2600
Edison	201/494-2800
Morristown	201/267-3222
Paramus	201/845-3900
Princeton	609/452-7277
Somerset	201/469-9444
Somerville	201/526-9658
New Mexico	
Albuquerque	505/247-4270
New York	
Albany	518/482-2035
Buffalo	716/835-9630
New York City	
Grand Central	212/557-8611
Penn Station	212/736-7445
Wall Street	212/962-8000
Rochester	716/263-2670
Syosset, L.I.	516/364-0900
Syracuse	315/422-2411
White Plains	914/694-4400
North Carolina	
Charlotte	704/552-6577
Greensboro	919/379-1155
Raleigh	919/847-7605
Winston-Salem	919/724-0630
Ohio	
Akron	216/535-1150
Cincinnati	513/769-5080
Cleveland	216/771-2070
Columbus	614/224-0660
Dayton	513/461-4660
Toledo	419/242-2601
Oklahoma	
Oklahoma City	405/722-7410
Tulsa	918/599-7700
Oregon	
Portland	503/223-6160
Pennsylvania	
King of Prussia	215/265-7250
Philadelphia	215/665-1717
Pittsburgh	412/261-6540
Rhode Island	
Providence	401/751-0065
South Carolina	
Columbia	803/256-7446
Greenville	803/271-7044
Tennessee	
Nashville	615/256-0625
Texas	
Austin	512/479-0720
Dallas	
Central	214/954-1100
North	214/387-1600
Fort Worth	817/338-9300
Houston	
Downtown	713/751-0100
Galleria/Post Oak	713/439-0550
San Antonio	512/342-9898
Utah	
Salt Lake City	801/966-3900
Virginia	
McLean	703/790-5610
Washington	
Seattle	206/454-6400
Spokane	509/838-7877
Wisconsin	
Green Bay	414/432-1184
Madison	608/251-0104
Milwaukee	414/277-0345
Canada:	
Ontario	
Toronto	
Don Mills	416/425-5730
Downtown	416/865-1125
Mississauga	416/848-3344

source edp®
Personnel Services

The world's largest recruiting firm that specializes exclusively in the computer profession.

Client companies assume our charges.

The Software Professionals' JOB FAIR

SOFTFAIR®

BOSTON
June 25 & 26
'84

Monday and Tuesday, June 25 & 26, 1984
4 PM to 9 PM, both days at the
Hillcrest Function Center
220 Bear Hill Road, Waltham, MA

These companies made SoftFair '84 a success. They saw SoftFair as a tremendous vehicle to meet experienced software professionals.

• Accupoint • ADE Corporation • Apollo Computer • Atex • Barry Controls • BBN Communications • BKW, Inc. • Boston Stock Exchange • Bunker Ramo Information Systems • Carleton Corporation • Charles Stark Draper Laboratory • Codex • Communications Analysis • Compugraphic Corporation • Computer Corporation of America • Computervision • Cullinet Software • Data General • Digital Equipment Corporation • Dynamics Research • The Faxon Company • The Federal Reserve Bank of Boston • The Foxboro Company • GCA • GENESYS Software Systems • Genrad, Inc. • Gould, Inc. • Graphic Communications, Inc. • Hills Department Stores • Honeywell • Infocom, Inc. • Interlan • IOCS • Leading Edge • LFE Corporation • LTX Corporation • Masscomp • McCormack & Dodge • The Mitre Corporation • NEC • New England Tech Writing Associates • Ovation Technologies • Prime Computer • Raytheon Data Systems • Raytheon Missile Systems Div. • Raytheon Service Company • RTC Systems • Sanders Associates • Sequoia Systems • Shawmut Bank of Boston • Softrend • Software International Corporation • Software Research Corporation • Texet • United Brands Company • Vitro Corporation • Wang Labs, Inc.

People like you also made SoftFair a success because they saw SoftFair '84 as a way to get a broad view of the software job market without writing lengthy cover letters, mailing numerous resumes or making inconvenient phone calls.

On June 25 & 26, SoftFair '84 returns to Boston. Sixty of New England's top-flight companies will be at SoftFair '84 to meet with software professionals in SALES, MARKETING, TRAINING, QUALITY ASSURANCE, SYSTEMS DEVELOPMENT AND SUPPORT, BUSINESS, MANUFACTURING, and SCIENTIFIC PROGRAMMING and other areas of the software field. Come in, meet them, and get a real good view of the New England marketplace.

If you can't attend SoftFair '84, send a resume with cover letter, in complete confidence, stating which companies you'd like to have receive your resume to: Dave Callahan, Software Career Link, Dept. CW 611, 67 South Bedford Street, Burlington, MA 01803, or for more information call (617) 229-5813.

SOFT FAIR '84 is sponsored by SOFTWARE CAREER LINK serving equal opportunity employers.

Intertech (International American Technologies Corp.) is seeking individuals for Saudi Arabian assignments. These single status contracts are 54 weeks and renewable, and pay up to 50K base salary per year, tax free. Benefits include housing in 5-star hotels, per diem, 5 weeks vacation with paid transportation, sick pay, free medical insurance, air conditioned company car, and paid overtime. Must be a U.S., U.K., or Canadian citizen.

Systems Analysts and Programmers

- Technical degree or equivalent with 5 years diversified experience including 2 years on FOCUS, with SAS Mark IV, DBII, or LOTUS on IBM 303X, 308X and 43XX.
- Technical degree or equivalent and 3 to 5 years experience with SIMPLAN financial modeling and reporting package, on IBM mainframes with TSO and VM/CMS.
- Technical degree with 5 years process control SCADA software experience with Fortran and Assembly on Harris M7500 and M9000, Honeywell 4500 or VAX II SCADA systems hardware.
- BSEE or equivalent with 5 years experience in communications data base administration and software applications on GTE #2 EAX switching system and SL 1 or GTD 1000.

Send your resume or call Will Gordon

Intertech Corporation
2 West Potomac Parkway
Williamsport, MD 21795
(301) 223-6400

Candidates interested in other positions in Saudi Arabia should send their resumes for numerous other opportunities currently available.

Equal Opportunity Employer

EXPERIENCED SYSTEMS PROGRAMMERS, ANALYSTS AND PROGRAMMER ANALYSTS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Everyday new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

Dunhill
OF CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28226
800-438-2012
(NC Call)
(704) 542-0312

SUNBELT INSURANCE POSITIONS
$25,000 to $45,000

Need several Senior Programmer/Analysts; Systems Designers; Consultants; and Project Leaders with Life Insurance or Software Package experience. Interview and relocation expenses paid by client.

Mail resume in confidence to:

Don Blouin Associates
3955 Pleasantdale Road
Suite 106-J
Atlanta, GA 30340
(404) 448-6611

LFE. We're already into tomorrow.

LFE is a leader in the design and manufacture of technologically advanced process control systems used in a variety of industries.

SOFTWARE ENGINEERING MANAGER

A challenging position exists for an experienced individual to manage a group of software engineers involved in the development of software for real-time control systems in a creative engineering environment. Must be experienced in Assembler and higher level language including the development of IO drives. Experience in RSX-11 M and Macro-11 M necessary. Knowledge of Pascal and VAX-VMS desirable. A minimum of 10 years related experience plus management capabilities required. Position involves approximately 70% hands-on design work and 30% management.

We offer qualified professionals generous compensation, a competitive benefits package, an innovative environment, liberal sick leave, 100% tuition reimbursement and RELOCATION ASSISTANCE. For IMMEDIATE consideration, call Stephen J. Zabek, Employment Manager, COLLECT at 617-835-1104 or send your resume with salary requirements to:

LFE Corporation
55 Green Street, Clinton, MA 01510

LFE

An Equal Opportunity Employer

COME TO FLORIDA

Enjoy the quality of life! "UNIX people" are in demand. All inquires made to:

A.P. and Associates
P.O. Box 20904
Orlando, FL 32814
Call Collect
(305) 896-4591
Linda Rutherford

SOFTWARE MANAGER - BSEE/MSEE. Will develop software for products.

SOFTWARE MANAGER - BSEE/BSCS. 'C' and UNIX interals with disk drive designs.

SOFTWARE DEVELOPMENT - Stuctural programming with the understanding of computer architecture and networking 'C' and UNIX operating systems.

All fees, relocation and expenses paid by company.

SENIOR PROGRAMMER

SPERRY **IBM PC**
DEC
WANG **UNIX**

MIDDLESEX COUNTY, NJ LOCATION

Join a growing company of computer professionals in creating insurance applications software for the 80's.

We are seeking a bright, responsible individual with a BSCS or equivalent degree, 4-6 years of FORTRAN experience, software engineering and numerical analysis.

Call Lynda, (201) 981-0775.

ISSS, INC.

SYSTEMS ANALYST - Design, development & implementation of online systems for bank interfacing w/international banking network. 1 yr. exp. or 1 yr. -programming. Bach. degree in ComSci or Engineering. Must know IMS DB/DC, COBOL, 360/370 Assembly, JCL, OS/VS1, OS/VS2, VSAM, TSO/SPF. $29,500/yr to work 35 hrs/5 days/wk. ACSIS, INC., 90 John St., NYC 10038. Send resume.

UNIVAC

Programmers, Systems Analysts, Data Base Analysts, Systems Programmers-Let us update you on the rapidly changing UNIVAC market coast to coast. To confidentially explore exciting new career opportunities, rush a resume or call Gary Repetto, CPC.

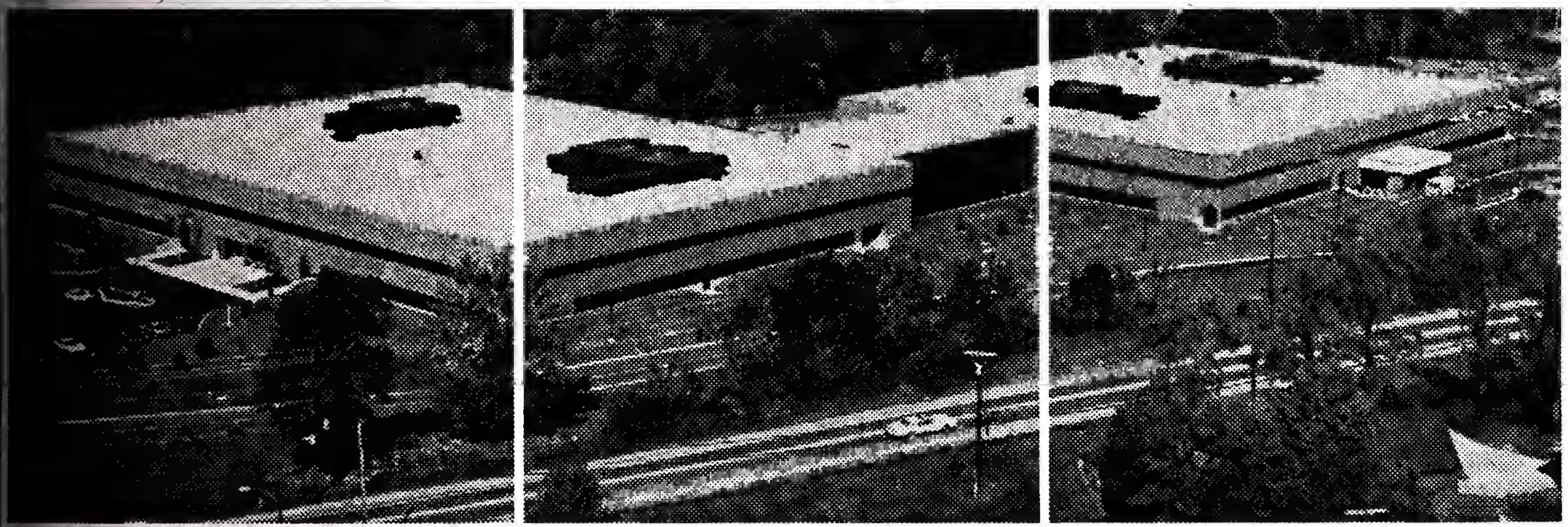
DUNHILL OF
ALBUQUERQUE, INC.
1717 Louisiana NE, Suite 218
Albuquerque, NM 87110
(505) 292-1871
Exclusively Employer Retained

SEEK OUT
THE RIGHT JOB
IN THE
CLASSIFIED PAGES
OF
COMPUTERWORLD

Call
800-343-6474
or
617-879-0700
for more information.

Challenges for experienced systems professionals.

Creating software for very large systems, and opportunities to match.



A new complex devoted to large systems programming.

Technical Life at IBM-Poughkeepsie:

shaping the future in high performance products.

Our Data Systems Division plans, designs, develops, tests, documents and evaluates the performance of IBM's largest computer programming systems. Investigate the future of large systems development at IBM in Poughkeepsie. The openings include:

MVS Systems Designers

Will develop new system architectures and apply advanced technologies to produce an MVS operating system offering new capabilities, capacity, performance, reliability and availability.

JES2/JES3 Systems Designers

Will work on system components that manage resources and work flows for IBM's largest computer systems, and develop mechanisms to control and coordinate multisystem environments.

For above positions you must have at least 4 years in MVS/JES systems, and be familiar with their externals and internals, and preferably with subsystems such as CICS, IMS or VTAM. BS, MS or PhD in CS, knowledge of IBM System/370 Assembler programming preferred.

Data Base Designers

Will develop data base technology necessary to handle data involved in managing large and complex computer system environments. Will have key role in IBM strategic applications support products. Familiarity with relational products or concepts desirable. Must have at least 4 years in development of data base systems, working knowledge of IBM's Data Dictionary, DL1 or comparable products; knowledge of System/370 Assembler programming, and preferably MVS or VM systems background.

Other Attractions

Poughkeepsie, in the mid-Hudson River area, is less than 2 hours from New York City. It's home to 6 colleges and universities that make the area ideal for pursuit of graduate degrees. A country club is available to employees. So are a wealth of cultural and recreational resources. The IBM benefits package is outstanding.

For prompt, confidential consideration, please send resume to: IBM Corporation, Experienced Professional Recruiting Department Y14-A, Building 415, P.O. Box 950, Poughkeepsie, New York 12602.

IBM®

An equal opportunity employer

enter the world of

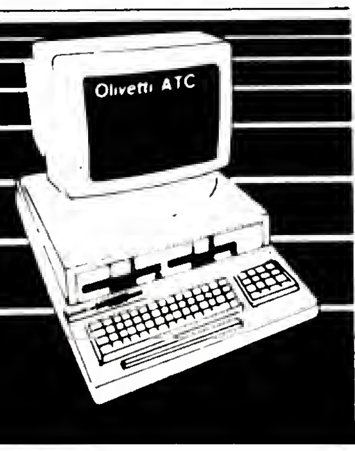
olivetti

Where "World Leader" Means More Than a Cliché!

LAN/OS DEVELOPMENT

Olivetti is the second largest manufacturer of computer systems in Europe and among the 10 largest worldwide. Our Personal Computer division is situated in the heart of Silicon Valley, conveniently located near Stanford University and the University of California, Berkeley, as well as year round recreational facilities.

We are currently forming a new group which will be involved in the advanced development of Local Area Networking/Operating System Development. We seek both junior and senior level engineers to participate in LAN projects for integrating our personal computer and minicomputer lines. This will involve extensions to our proprietary multi-user OS, MS-DOS and UNIX as well as long-haul communications with mainframe hosts, e.g. IBM/SNA systems. To qualify for these positions, we prefer that you have at least 2 years related experience. An indepth knowledge of one or more of the following areas is strongly recommended: LAN development, MS-DOS internals, UNIX internals, 3270 terminal emulation and IBM/SNA. A BSCS is required, an MSCS is preferred.



Enter the world of Olivetti. We'll offer you a competitive salary and a complete benefits package which includes four weeks paid time off. To apply, please send your resume to Professional Employment, Department 28, Olivetti ATC, 10430 South De Anza Blvd., Cupertino, CA 95014. We are an equal opportunity employer.

UNIX is a trademark of Bell Labs.

OS/MVS Systems Programmers

Test your mettle in one of the world's most advanced IBM environments.

A bit about SMS

SMS invites you to take a look at the future. You'll see it in our Data Center which handles over 3 million transactions a day, has a telecommunication capacity which rivals that of many major cities, and incorporates one of the world's most advanced IBM hardware configurations (multiple 3081s, 3033s and 4341s delivering over 70 M.I.P.S. of processing power to 6,500 terminals). But these are just facts and figures. The real story tells of the programmers and analysts who bring this technology to life.

Right now, we have positions available in our Systems Development Group for programmers whose background includes at least one year in an IBM OS/MVS environment. Experience in one or more of the following areas would be a significant plus:

- **CICS Internals**
- **DB Internals**
- **Telecommunications**
- **IBM PC Data Communications**
- **OS/MVS Systems & Sub-systems Support**

SMS offers a competitive salary, generous relocation assistance, and a benefits package which includes stock purchase, tuition refund, and dental plans. In addition, these positions represent an exceptional opportunity for continued technical and management development. For immediate consideration forward your resume to: SMS, Department CW-24RS, 51 Valley Stream Parkway, Malvern, PA 19355. An equal opportunity employer.

SMS

Shared Medical Systems Corporation

INFORMATION SYSTEMS FOR THE HEALTH CARE INDUSTRY...TWICE THE CAREER POTENTIAL

Nigerian Computer Professionals

Nigerian Nationals with varied Technical backgrounds such as Geology, Petroleum Engineering and General Engineering are required by the Shell Petroleum Development Company of Nigeria Limited for the computer positions detailed below:

SYSTEMS ANALYST/DESIGNER

Requires a BS or equivalent in a technical or commercial discipline plus at least 4 years COBOL or FORTRAN programming experience and 2 years Systems or Design experience/knowledge of on-line programming and minicomputer applications. Starting salary N11,400.00.

SENIOR PROGRAMMERS

Requires a BS or equivalent in a technical or commercial discipline plus at least 4 years COBOL or FORTRAN programming experience. Starting salary N9,450.00.

Conditions of service for both positions are not only attractive but competitive within the oil industry.

Professional advantages:

You will work on an IBM 4341 environment under DOS/VSE and interactive programming tools in our Lagos office. Should you be transferred to our Eastern Operations Division in Port Harcourt you will find an equally progressive IBM 4341 installation, and an RJE Terminal in our Western Operations Division in Warri linked via microwave to Port Harcourt. Throughout the entire operation you will deal with the latest concepts in interactive processing and minicomputer technology in the development of a wide range of commercial/technical systems. You will find the work and the working environment both stimulating and challenging

Interested applicants should submit resume to:

Overseas Recruitment, 111
Scallop Corporation,
One Rockefeller Plaza,
New York, New York 10020.

(Scallop Corporation is a Royal Dutch/Shell Group Company).

PACIFIC NORTHWEST

Interview and Relocation Exp's Paid

HEADHUNTERS NATIONAL is a professional recruiting organization that works exclusively in the areas of Engineering, Manufacturing Management and Executive positions within the Electronics Industry. Career opportunities available locally, throughout the Pacific NW and nationwide.

Graphics S/W...... $35K-$45K
BSEE/BSCS-MSEE/MSCS. Work as team member in developing new high performance color graphics smart workstations. Develop code and firmware for multi-tasking microprocessor based system. Well established corporation, excellent benefit package, profit sharing. Contact Del Lashbrook.

Graphics Mktg .... $30K-$45K
BSEE/BSCS, MBA. Recommend and direct the development of overall strategies for a new series color terminal. Well established corporation. Excellent benefit package. Contact Del Lashbrook.

Project Engr........ $30K-$45K
BSEE/MSEE or CS. 5 years in H/W logic-analog design and some S/W design of single board microprocessor equipment with communication. 68000, modems, a plus. Strong ability to interface effectively. Excellent benefit package plus stock. Contact Des McKenna.

All fees are paid by our client companies. Call or send your resume.

(503) 297-1451
Professionals For Professionals
HEADHUNTERS
National Agency, Inc.
1750 SW Skyline Blvd.
Portland, OR 97221

RESUMES

All Writing Needs

- Effective, professional
- For today's job seeker
- Free cover letter package
- Fast, reliable, confidential
- Creative & editorial services

FORD/YOUNG
ENTERPRISES
P.O. Box 157
Villa Park, IL 60181
(312) 530-8818

FINANCIAL DATA PROCESSING PROFESSIONALS

Immediate opportunities in New England for Programmers, Analysts and System Software Specialists with 2 years minimum experience in financial applications.

Most situations in IBM environment with data communications network and data base systems. Operating Systems include DOS/VSE, CICS and VTAM.

Salary open. Fee paid. Please submit resume, including salary requirements to: T.J. Brescia

JENNINGS EMPLOYMENT
SERVICES, INC.
11 MAIN STREET
EAST GREENWICH, RI 02818
Replies handled in confidence.

Systems Analyst

Embry-Riddle Aeronautical University is seeking a person with 3-5 years experience using COBOL. Student records and HP experience a plus. Located in the Daytona Beach area with excellent working conditions including education benefits.

Please send resume and salary history to:

U-E
Star Route
Box 540
Bunnell, Florida 32010
EEO/AA

Information Systems Specialist. Develop computer system for use in import and export business. Design program and update software for accounting system using COBOL, FORTRAN, INTEL 8080 Assembler and Assembly language. 40 hours/week; $1,900/month; BS in Business; 1 year experience in job offered or 2 years experience in Business Management; course work in computer programming using Assembler, COBOL and FORTRAN. Apply at Texas Employment Commission, Houston, Texas or send resume to Texas Employment Commission, TEC Building, Austin, Texas 78778. Job Order #3474888. Ad paid for by an equal opportunity employer.

SOUTHEAST FLORIDA PROGRAMMERS

Growth oriented insurance company has several openings for Programmers with strong background (2 years minimum) in DOS/VSE, CICS and VSAM. Please send your resume and salary requirements to:

Mrs. Harriet Davis
American Risk Assurance Co.
6600 SW 57th Ave.
Miami, FL 33143

MOVE AHEAD WITH COMPUTERWORLD

More computer people read **Computerworld** than any other newspaper in the United States; more than half a million computer people every week.

Among our readers at user organizations, about half claim to look at recruitment ads every other week (only a small percentage say they never look at recruitment ads).

No wonder **Computerworld** carries more recruitment ads for computer people than any other publication. To place your ad or to get a rate card with complete details on **Computerworld's** Classified Section, call or write: **Classified Advertising, COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, MA 01701. 1-800-343-6474 - 617-879-0700. Telecopier Extensions 410 451**

The ROMAC guarantee.

Yes, our track record is far better than most in the industry. No, we're not perfect; but our guarantee is:

"If, for whatever reasons within a specified time frame, you are not satisfied with a ROMAC® placement, we will honor our written guarantee."

We're that sure we can make the kind of placement for you that stays placed.

ROMAC®, the placement firm with a proven record of placement success in the data processing profession.

Meet with Success.

CONNECTICUT
140 Sherman St.
Fairfield 06430
203-255-9145

One Financial Plaza
Hartford 06103
203-525-8037

FLORIDA
800 W. Cypress Creek
Ft. Lauderdale 33309
305-928-0811

One Tampa City Ctr.
Tampa 33602
813-228-6327

GEORGIA
3340 Peachtree, NE
Atlanta 30326
404-231-3535

MAINE
477 Congress St.
Portland 04101
207-773-4749

MARYLAND
400 E. Pratt St.
Baltimore 21202
301-625-0400

MASSACHUSETTS
125 High St
Boston 02110
617-482-6616

1 Newton Exec. Park
Newton 02162
817-969-4010

MINNESOTA
4410 IDS Center
Minneapolis 55402
612-333-0126

NEW HAMPSHIRE
P.O. Box 4164
Portsmouth 03801
603-431-2706

NEW JERSEY
S-10 Rt. 17
Paramus 07652
201-845-7668

NEW YORK
One Steuben Place
Albany 12207
518-463-6644

60 Lakefront Blvd.
Buffalo 14202
716-853-6203

1 Marine Midland Plz.
Rochester 14604
716-232-4610

NORTH CAROLINA
2000 W. First St.
Winston-Salem 27104
919-725-1933

OHIO
840 Nat'l City Bnk Bldg
Cleveland 44114
216-771-6822

150 E. Broad St.
Columbus 43215
614-221-7077

111 W. First St.
Dayton 45402
513-461-1373

PENNSYLVANIA
1700 Market St.
Philadelphia 19103
215-568-6810

RHODE ISLAND
1150 New London Ave.
Cranston 02920
401-463-7600

TENNESSEE
1 Commerce Sq. 2550
Memphis 38103
901-523-0500

VIRGINIA
1205 E. Main St.
Richmond 23219
804-644-0196

WASH. DC AREA
1600 Wilson Blvd.
Arlington, VA 22209
703-525-5160

ROMAC®

Romac & Associates • Personnel Consultants

Bryant Bureau

The Recruiting and Placement Specialists

HAS THE COMPUTER PROGRAM FOR YOU

If you're not accomplishing your career goals, let us put you in the right environment. Our national database of client companies are continually looking for progressive DP professionals who want to remain state of the art.

NATIONWIDE OPPORTUNITIES

IBM Tech Support Mgr, DOS/VS	to $40K
IBM P/A, Insurance, CICS, BAL	to $35K
IBM BAL Pgmr,OS/MVS,CICS,Macro	to $34K
IBM CPCS Pgmr, OS/VS1, banking	to $32K
TANDEM Systems Analyst	to $48K
TANDEM Programmer Analyst	to $31K
BUR MCP Source Patching Spec.	to $40K
BUR DMSII Software Specialist	to $34K
HON Appl SW Analyst (DMIV/TP)	to $28K

To become part of the growth in the 80's, call toll free or send your resume with salary history and any relocation restrictions.

Bryant Bureau
DP Division
4000 S. Tamiami Trail, S-547
Sarasota, FL 33581
(800) 237-9497

ROBERT HALF®

EDP OPPORTUNITIES
COAST TO COAST

Robert Half, staffed by EDP professionals for EDP professionals with 80 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets ...... ALL FEES ARE PAID BY CLIENT COMPANIES, OF COURSE. The following is a partial listing of opportunities and locations:

ALBUQUERQUE

PROG/ANALYST

Excellent growth position with expanding IBM large scale shop. COBOL, CICS. Financial applications. Salary **$32,000**

Dick Starnes
ROBERT HALF
of New Mexico
P.O. Box 3320
Albuquerque, NM 87190
(505) 884-4557

AUSTIN

CICS PROG/ANALYST

2 positions available in south-central TX. Co has twin 4331-s running VSE. Starting conversion to OS/MVS. 2 plus yrs CICS command level exp a must. Low **$30's** + Bonus

SOFTWARE ENGINEER

Min requirements are MS or PhD in related field plus 3-5 yrs exp in Development and Design of Scientific oriented pkg's. Data acquisition a big plus. System is Vax 11/780 running Fortran & Assembly. Salary to **$45,000 plus**

ROBERT HALF
of Austin, Inc.
400 E. Anderson #334
Austin, TX 78752
(512) 835-0883

MILWAUKEE

SR SYSTEMS ANALYST

Fortune 500 giant seeks IBM MVS heavyweight. Will lead high-visibility projects and have direct control of supporting staff. Opportunity to quickly advance to management role. Data base preferred. **$36-42,000**

SR PROGRAMMER ANALYST

New systems development. Will act as team leader on large projects. Requires 2+ years IBM COBOL with solid communication skills. Data base or on-line a big plus. **$24-33,000**

Brian Krueger or Dick Bird
ROBERT HALF
of Wisconsin
777 E. Wisconsin Ave.
Milwaukee, WI 53202
(414) 271-HALF (271-4253)

PROVIDENCE

HP3000 PROG/ANALYST

Rapidly expanding co seeks 2+ yrs HP 3000 sys exp w/IMAGE/VIEW. Solid COBOL programming skills req. Software devel resp. Salary **$26,000**

ROBERT HALF
of Providence, Inc.
900 Turks Head Bldg.
Providence, RI 02903
(401) 274-8700

MINNEAPOLIS ST. PAUL

S/38 SUPERVISOR

Positions in retail & mfg. Genuine supervisory opportunities. Involves design, development & maintenance of corporate systems at well-known Twin Cities headquartered firms. Must have 5 yrs DP, 1 with S/38. To low **$30,s**

Mark David
ROBERT HALF
of Minnesota, Inc.
3636 IDS Center
Minneapolis, MN 55402
(612) 339-9001

WASHINGTON

ANALYST'S DELIGHT

Growth opportunity with Fortune 500 Co in MD! Must evaluate IVM software! Mainframe, data base, mini, and PC. Will manage five. **$40,000**

ROBERT HALF
of Washington
7316 Wisconsin Ave.
Suite 401
Washington, DC 20814
(301) 652-1960

SAN ANTONIO

TELECOMMUNICATIONS ANALYST

Degree needed. Must have 8+ yrs exp in Data Comm, Data/ Voice Network, Planning design and support, Voice Data modeling. PLUS's are Datapoint, Essonet, Data Switching. Excellent growth earnings potential. 4 day work week. **$34-38,000**

ASS'T OPERATIONS MANAGER

Degree preferred, not req'd. Must possess 5+ yrs in IBM large mainframe, OS/MVS, Communications. Cullinet, COBOL, Console and training ability. PLUS's rare. 30XX exposure plus large multi-mainframe ability. Very visible and promotable to next level within 18 months. **$25-29,000**

SYSTEMS ANALYST

Degree req'd. 8+ yrs DP exp in COBOL, DOS/VSE, CICS, VSAM, CMS, Fin'l Distr appls. PLUS's are OS/MVS and Billing appls. Excellent growth potential and learning curve with mgmt position within year. **$32-38,000**

All positions above and many more are in Texas where "Long Necks," "Armadillos" and the "Cotton Eyed Joe" call home.

Bob Baldauf
ROBERT HALF
of San Antonio, Inc.
6243 IH 10 West, Ste. #850
San Antonio, TX 78201
1-800-531-5402
In TX dial (512) 736-2467

NEW YORK

MANAGER DATA BASE ADMINISTRATION

A major organization in the New York City public sector, with a rapidly expanding large Data Processing installation, is seeking a Manager of Data Base Administration. Candidate must have 3+ years DB Administration experience utilizing IDMS. Position will be key with full administrative/technical responsibility. Excellent fringe benefits. Fee Paid. **$55,000**

ROBERT HALF
of New York, Inc.
522 Fifth Avenue
New York, NY 10036
(212) 221-6500

BOSTON

TECH SVCS DIRECTOR

Outstanding service co seeks strong mgr to oversee DBA & oper sys grps. Strong IBM OS/ MVS IMS DB-DC, multi-CPU & telecom shop. Apply your dynamic mgmt skills to this corp level hi-vis pos. **$55,000**

MFG SYS ANALYST

Not making any progress in your current job? This growing hi-tech mfr seeks a polished sys analyst for new apps devel projs. Diverse tech environ incl IBM OS/ MVS IMS & mini/PC. Great oppty to enhance your tech & apps bkgrd. **$38,000**

FOCUS SYS ANALYST

Leading fin'l svcs co seeks strong analyst to devel new sys for user dept. State-of-the-art IBM VM/ CMS, FOCUS, PC's, LOTUS environ. Exciting oppty to manage people & projs w/hi-vis to top execs. **$32,000**

ROBERT HALF
of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200

NEW ORLEANS

ASST DP MGR

4+ yrs hands on exp w/lrg IBM, DOS/VSE, VSAM. Responsible for maintenance & optimization of oper sys & major subsystems. To **$38,000**

SOFTWARE SYSTEMS ANALYST

4-6 yrs exp in systems design to provide transaction of data base security. Pluses are ability to support MVS, CAD/CAM or DBII. **$40,000**

ROBERT HALF
of New Orleans
P.O. Box 57629
New Orleans. LA 70157
(504) 835-4296

SEATTLE

COBOL P/A

Seeking programmer/analyst with 2+ years heavy COBOL programming experience in IBM OS MVS environment to design and develop financial applications. Excellent environment for those seeking rapid career advancement. To low **$30's**

DATA BASE ANALYST

Headquarters of national firm seeks individual with 3+ years data processing experience in IBM OS environment, including 2+ years DL/1 and COBOL to join data base group. Will assist in all areas of data base planning, design, testing, and implementation. Position provides excellent opportunity for learning and career growth in the data base area. Salary **DOE**

Marjie Peterson
ROBERT HALF
of Seattle, Inc.
600 University St., #2328
Seattle, WA 98101
(206) 624-9000

ST. LOUIS

BUSINESS PROGRAMMER ANALYST

Many openings available immediately! Expanding service organization seeks P/A's with 2+ yrs COBOL applications in an OS/MVS environment. Financial and business systems and new development. PC-main-frame interface experience a definite plus! Great opportunity! To **$33,000**

"C" PROGRAMMER

Contract firm has an immediate need for a local assignment to a Fortune 500 corporation. Minimum requirements are 2 years "C" programming in a UNIX system. To **$28,000**

PROJECT LEADER

Service organization in St. Louis suburb seeks P/L with 43XX DOS/VSE experience to back the DP Manager. Pluses are BS degree, Life Com, MSA, Life 70, BAL, and project leadership. To **$35,000**

RPG II SYSTEMS ANALYST CENTRAL MISSOURI

Retailer needs a S/34 S/A with 2+ years programming and heavy analysis background. You will program lightly and have heavy user contact. Future plans include expansion to a S-38. To **$30,000**

DATA SECURITY ADMINISTRATOR

Fortune 500 corp seeks individual to design, establish, and implement their data security program. Requirments are 3 yrs experience in business systems or software systems in a large IBM environment. Experience with IMS/VS, TSO, RAMIS, RACF, and data dictionary preferred. Excellent benefits and career path opportunities. **$35-45,000**

Randy Pace or
Warner Coffman
ROBERT HALF
of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

HARTFORD

PERF SPEC

3+ yrs exp in IMS perf/ capacity planning for new data ctr expansion. Indiv will plan, configure all cur/future DB oriented projects. Salary to **$43,000**

TELE-COMM

Multiple oppty's in CT for indiv's with IBM software and TP tech mgmt bkgd in lg data comm, network plng environment. Salaries to **$50,000**

IDMS/IMS

1984 expansions plans into DB/ DC syst's req 4 data base indiv's to support corp DBA. Any industry bkgd. Salary to **$45,000**

CICS

Sr level internal consultant positions for CICS command/micro lev indiv to provide support for new on-line dev projects. Immediate mgmt potential. Salary to **$38,000**

S/36 S/38

Increasing demand for indiv's with mfg app'l exp has opened up several oppty's for S/36 RPGII or S/38 RPG III prog/analysts. MAPICS a plus. To **$35,000**

DP MANAGER

Oppty for DP pro with 5+ yrs exp in mfg and fin'l syst to join $100M+ co as sr DP officer. Degree req'd. IBM bkgd a plus. Excel growth oppty. To **$53,000**

SYSTEMS PROGRAMMER

Oppty for indiv with 2+ yrs MVS or VM systems exp to join prestigious org. Participate in 1984 growth by installing MVS/VM software. Suburban Htfd div of Fortune 500 corp offers excel salary + benefits. To **$42,000+**

ROBERT HALF
of Hartford, Inc.
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

SOUTHERN CALIFORNIA

EDP/AUDIT-CORPORATE

Major financial institution needs your sys & prog skills with some exposure to EDP-audit for move to corporate. To **$40,000**

ROBERT HALF
of L.A.
3600 Wilshire, #2000
Los Angeles, CA 90010
(213) 386-6805

BUFFALO

SOFTWARE CONSULTANT

Well-known Int'l consulting firm has multiple openings for software systems pro's. Min 2 yrs exp. Tech skills desired: COBOL, CICS, IMS, PL/1 Assemb. Positions throughout USA. Exciting life style. To **$40,000**

ROBERT HALF
of Buffalo, Inc.
420 Main Street
1310 Liberty Building
Buffalo, NY 14202
(716) 842-0801

FREE:
Ask for our latest
Salary Survey

COMPUTER SYSTEMS TECHNICAL MANAGEMENT

A Saudi organization of fourteen companies responsible for developing and promoting petroleum and mineral industries within the Kingdom of Saudi Arabia, has embarked upon a program to develop and implement advanced computer systems to support all facets of its operations. Senior professionals are urgently required in the Jeddah corporate offices to take a leading role in this effort:

• SYSTEMS MANAGER - MARKETING AND BULK PLANTS

Responsible for company-wide implementation and ongoing development of systems supporting domestic sales including bulk and packaged products, international marketing activities, and automated bulk plants. Ten years or more experience required. Consulting background a plus.

• SYSTEM MANAGER-ACCOUNTING, BUDGETING AND PERSONNEL

Responsible for company-wide implementation and ongoing development of eleven integrated systems, including general ledger, budgeting, cost accounting, fixed assets, consolidations and cash management. Recognized accounting qualification required.

• SYSTEMS MANAGER-MAINTENANCE, WAREHOUSING AND PURCHASING

Responsible for company-wide implementation and ongoing development of integrated on-line systems supporting maintenance planning for refineries and the related warehousing and purchasing systems. Ten years or more experience required. Consulting background a plus.

• DATA ADMINISTRATOR

Responsible for company-wide coordination of corporate date, coordinates data base administration and data base design functions. Eight or more years experience required.

• MANAGER-TECHNICAL AND APPLICATIONS SUPPORT

Responsible for providing technical support including systems programming, hardware planning and data communications and providing application support including ongoing development of corporate computer systems. Ten or more years experience required. Consulting background would be a plus.

• TECHNICAL SUPPORT MANAGEMENT

Responsible for technical support for five computer centers including systems programming and hardware configuration planning. Eight or more years experience.

• APPLICATION SUPPORT MANAGEMENT

Responsible for application support including the development and implementation of new or revised computer systems and maintenance of existing computer systems. Eight or more years experience required.

• TELECOMMUNICATIONS MANAGEMENT

Responsible for planning, designing, implementation and operating corporate data communications between five data centers. Eight or more years experience required.

• ACCOUNTING SYSTEM SPECIALIST

Provide expert support in the implementation and operation of integrated on-line accounting systems and coordinate accounting practices throughout petromin subsidiaries. Six or more years experience required.

Each position requires experience in the design and implementation of computer systems, management responsibility, and knowledge of one of the above speciality areas. A university degree is required. Prior Middle East experience is desirable.

Qualified candidates should indicate position applied for and send resume and salary requirements to.

The salaries for the above positions are tax free, with single or married accomodation and other company benefits comparable with the highest international level.

Contact Chipher 24 - E900023 Publicitas 6901 Lugano Ch, Switzerland

---

SYSTEMS PROGRAMMERS

FLORIDA

CICS SYS PROG	$28K - $34K
OS/MVS SYS PROG	$28K - $34K
VTAM/ACF SYS PROG	$28K - $34K

Immediate Hires.

All fees including interviewing and relocation expenses paid by client company.

Call (904) 725-0667 or send resume to:

Kelly Davidson
ADVANCED RECRUITERS INC.
P.O. Box 19141
Jacksonville, Florida 32245-1941

All resumes confidential.
All fees paid by client companies.

TAKE A TURN FOR THE BETTER...

There is a lot to be said about working for the "1983 Florida Company Of The Year" — Ryder System, Inc.

Ryder Truck Rental, Inc., a division of Ryder System, Inc., currently has the following opening:

SYSTEMS PROGRAMMER

We are seeking a senior level Systems Programmer with experience in MVS internals. The major responsibilities include planning, implementing, and supporting MVS/XA, JES 2, and related products. A strong business prospective including long range technical planning and cost/benefit analysis is a plus.

Your expertise will be rewarded and recognized appropriately by a company named as one of the "100 Best Companies To Work For In America".

Call (305) 593-3359 (collect) for an interview or send your resume in complete confidence to:

M. Anderson
Manager, Human Resources
RYDER TRUCK
RENTAL, INC.
P.O. Box 020816
Miami, FL 33102-0816

RYDER

A Service of Ryder Systems

An Equal Opportunity
Employer M/F/V/H

DATA PROCESSING PROFESSIONALS

DATA RESOURCE CORPORATION, headquartered in Atlanta, is a leader in quality Contract Programming and Consulting. Our growth in the Southeast and Southwest has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design.

We are seeking individuals who desire to work in various stimulating Data Processing environments. IMS and CICS skills are of special interest, as are the abilities to travel or relocate.

We offer you competitive salaries and comprehensive benefits programs, including bonuses and profit sharing, and overtime pay. If you are searching for a growth opportunily with a dynamic and progressive company with a Management team that "puts people first", then DRC is your answer.

For immediate consideration, send resume to 3301 Buckeye Rd., Suite 103, Atlanta, GA 30341, or call BECKY FINLEY or JIM BARRETT at 404-455-7260, or toll free.

1-800-241-6002

DRC

EOE

COMPUTER SCIENCE POSITION

The University of Minnesota, Morris seeks an individual with an MS in Computer Science, e year of teaching experience et the teaching assistant level and evidence of nationally recognized scholarly ectivity. Position requires strong interest in teaching and research. Individual would be expected to develop and teach upper division courses such es Operating Systems, Compiler Design, Automata Theory and Computer Architecture. UMM Is recipient of e Title III grant from U.S. Dept. of Education to develop these advanced undergraduate courses. Tenure-track, Instructor. Salary negotiable, excellent fringe benefits. Start Sept. 16, 1984.

Computer facilities Include DEC VAX-11/750 under VMS, PDP-11/44 under UNIX, access to CRAY-1, CDC CYBER-170/825, 845, 174, IBM-4341 end several microcomputers. Computer facilities are also being expanded under Title III grant.

UMM Campus Is located 150 miles west of Twin Cities Metro area, et edge of Minnesota's famous lake region.

Send resume, transcripts and three letters of recommendation by July 15, 1984 to:

Dr. James Olson, Chairman
Division of Science and Mathematics
Room 217
University of Minnesota, Morris
Morris, MN 56267

The University of Minnesota, Morris is an equal opportunity educator and employer and specifically invites and encourages applications from women and minorities.

PROGRAMMERS
PROGRAMMER ANALYSTS
SYSTEMS PROGRAMMERS

Rapid growth and opportunity with Florida's largest Bank Holding Company.

We are Barnett Computing Company, the Data Processing subsidiary of a statewide Bank Holding Company with assets in excess of $11 Billion, and the second largest Bank Holding Company in the Southeast.

Our continued growth has created new and exciting opportunities for Programmers, Programmer Analysts and Systems Programmers in our Applications and Technical Programming Departments. We require individuals with one year and up working experience with the following:

— IBM large systems
— OS/MVS, JCL, COBOL

Previous work experience with some of the following is preferred:

— NCF/VTAM
— CICS Internals
— Assembler
— Tandem and TAL
— Online programming
— Banking Applications:
Deposits, Commercial Loans,
Credit Card, Installment
Loans, ACH, Inventory,
Fixed Assets.

We offer a highly competitive salary program, superior benefits and relocation assistance, along with the opportunity for personal and professional growth in an ideal location. Send your resume including salary history in confidence to:

Barnett Is Florida's Bank.

Barnett Bank

Employment Manager
BARNETT COMPUTING COMPANY
P.O. Box 10068
Jacksonville, FL 32207

Equal Opportunity Employer M/F/H/V

APPLICATIONS PROGRAMMER/ANALYST

As in Applications Programmer/Analyst, working under supervision, analyze scientific systems specifications and develop programs using Numerical Method, Statistics, Probability, end Finite Element Techniques. Requires use of Assembly Language (PDP-11). Responsibility will encompass maintenance of software system. Requires Mester's Degree In Computer Science. Education should include at least two courses In both Numerical Analysis and Assembly Language as well es one course in Finite Element Methods. Send resume to Constance Leahy, Personnel Representative, Northwestern University, 339 East Chicago Avenue, Chicago, IL 60611.

COMPUTER SCIENCE

Tenure track faculty position beginning Fall 1984. Grand View College needs person to teach courses in Computer Science. Masters degree required; Doctorate preferred. Teaching and/or work experience desirable. Instructor or Assistant Professor rank. Salary commensurate with experience. Church-related college with expanding program. Send letter of application and credentials to Dr. Thomas Fischer, Vice President for Academic Affairs, Grand View College, 1200 Grandview, Des Moines, Iowa 50316. An Equal Opportunity Employer.

DO YOU LACK PROFESSIONALS?

Like all industries the computer industry is rapidly growing and with this growth comes change. We know that in order for your business to keep up with the times you must have qualified people in key places. Our studies show that Computerworld reaches people in every aspect of the computer industry. With over 121,000+ paid readership Computerworld could be reaching the qualified personnel you're looking for.Our circulation ranges from Consultants, Engineers, Managers, Systems Analysts, Controllers, and DP/MIS professionals.

Computerworld is doing everything possible to ease the problems related to advertising. We will accept camera ready copy, typeset copy mailed into us, or accept simple ads over the telephone. Our current agate line rate is $9.15, per column inch we are $128.10. Our minimum ad size is 1 column x 2" and costs $256.20. For more information call or write:

COMPUTERWORLD
Classified Advertising
375 Cochituate Road
Box 880
Framingham, MA 01701

800-343-6474
(617) 879-0700

Cray Research, builder of the world's fastest supercomputer, the X-MP, has an immediate need for a few highly motivated individuals in the Central Region division. Strong customer relations skills are critical, as are good oral and written communication skills. Accepted candidates will receive extensive training in Minnesota or Wisconsin before site assignment..

CRAY RESEARCH, INC.

SR. CUSTOMER ENGINEERS

Requires a minimum of 4 years experience in the maintenance of large scale computer systems and peripherals.

PROGRAMMER ANALYSTS

Requires a minimum of 4 years experience in operating system internals, assembly language and FORTRAN. The qualified person will be responsible for installation and maintenance of the operating system and provide technical support to the computer operations staff.

APPLICATION ANALYSTS

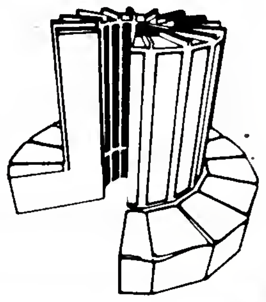
Requires a minimum of 4 years experience in assembly language and FORTRAN. The qualified person will be responsible for user consultation and program conversion.

Available positions and locations are:

- Montreal, Canada — Programmer Analysts (Canadian citizenship required)
- Detroit, MI — Sr. Customer Engineers, Programmer Analysts, Application Analysts with structural and finite element analysis experience.
- Omaha, NE — Sr. Customer Engineers, Programmer Analysts
- New Mexico — Sr. Customer Engineers, Programmer Analysts, Application Analysts

Cray Research offers an outstanding employment package which includes a highly competitive salary, liberal benefits and a unique profit sharing plan. If you are interested in a challenging and rewarding career where growth is limited only by individual contribution, please submit your confidential resume and salary history, stating your geographical interest to:

Employment Supervisor
CRAY RESEARCH INC.
5330 Manhattan Circle/Suite F
Boulder, CO 80303



Technical interviews will be scheduled with qualified candidates. Agency response will not be acknowledged.

Equal Opportunity Employer
M/F/H/V
U.S. citizenship required.

The Supercomputer People

SAUDI ARABIA

SYSOREX INTERNATIONAL, a California Corporation and a rapidly growing systems management company now developing innovative multi-technology systems in Saudi Arabia has the following challenging position:

DATA PROCESSING PROJECT PLANNER

Min. 15 yrs. DP experience required, with extensive hardware/software knowledge and evaluation. Min. 5 yrs. recent large-scale IBM systems environment (303X, 308X, OS/MVS) required.

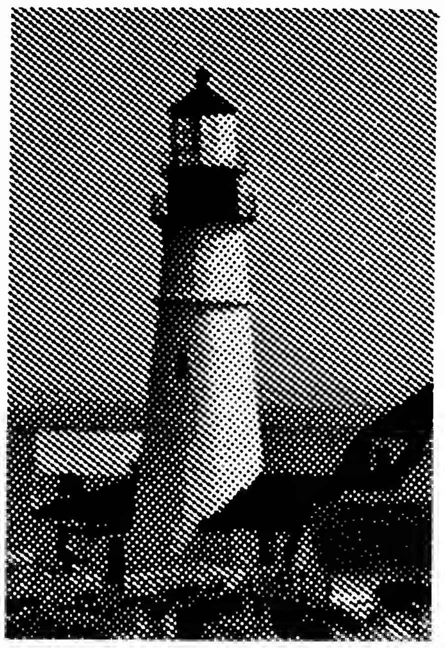
Will act as primary staff resource for all equipment/software recommendations. Strong Interpersonal skills, as well as demonstrated planning and charting capabilities required.

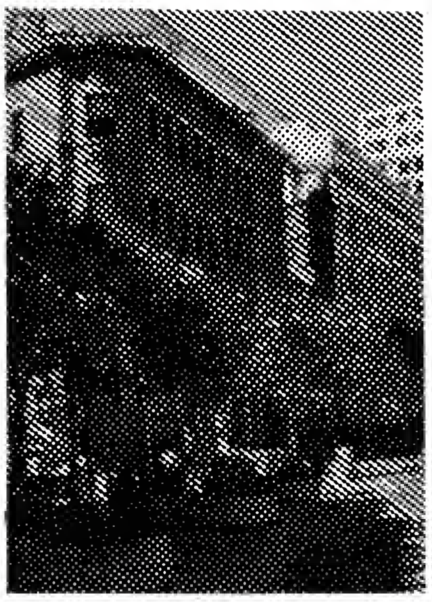
We offer an excellent benefit package including: medical, life, accidental death, disability and profit sharing plans. You will additionally receive 25 working days vacation, 15 holidays, free furnished housing, annual return home travel, paid relocation expenses, plus eligibility for present federal income tax exclusions.

Please send resume with present salary to Personnel Dept. SYSOREX INTERNATIONAL, INC., 10590 N. Tantau Ave., Cupertino, CA 95014. U.S. CITIZENSHIP REQUIRED. PRINCIPALS ONLY APPLY.

SYSOREX
Sysorex International Inc.

MIS Professionals: have you been to Portland, Maine... lately?





Where does all the sophisticated digital technology take place today? Where has extensive capital investment generated rapid growth and created exceptional career opportunities? At Fairchild's Digital Division in Portland, Maine, where we are introducing one of New England's first IBM 4381-1 MVS/XA and distributed System/38 installations.

And its' all happening in Portland — where countrified charm, low cost of living, easy access to metropolitan areas, and a wealth of recreational and cultural activities combine to create a lifestyle that's second to none. In addition, Fairchild offers salaries and benefits that are fully competitive with Route 128 and Silicon Valley, as well as the unlimited challenges that can mean professional achievement and personal growth. We invite highly motivated MIS professionals to consider the following opportunities with our multi-national company.

SENIOR SYSTEMS PROGRAMMER

To provide technical leadership and support in a new IBM 4381-1 MVS/XA installation. Candidates must have a minimum of 3 years MVS experience including MVS internals, TSO, VSAM, CICS, JES2, VTAM or TCAM. MVS/XA and IDMS experience are a plus. BSCS/BSEE or similiar degree required; MSCS preferred.

SENIOR SYSTEM/38 PROGRAMMERS

To design, implement and maintain manufacturing and inventory control systems written in RPG III and COBOL on a System/38, with gradual migration to MVS database during the next 2 years. Successful applicants will have 3 years programming and design experience and should be familiar with System/38 (experience with another database system will be considered). BS/BA required, prefer Computer Science or Business concentration.

Our unparalleled high-tech environment boasts the latest in equipment, new product lines and exceptional growth opportunities. Discover the exciting challenges, top industry compensation, benefits including comprehensive Medical/Dental plan, Life/Disability insurance, Profit Sharing and Advancement Potential these uniquely rewarding positions can offer. Please submit your resume, in confidence to: Rip Dyer, 333 Western Avenue, South Portland, Maine 04106.

NO AGENCY REFERRALS WILL BE ACCEPTED UNTIL AFTER JUNE 29th.

EXTREMELY COMPETITIVE RELOCATION PACKAGE AVAILABLE.

An Equal Opportunity Employer M/F/H

FAIRCHILD
A Schlumberger Company

DATA PROCESSING

We Are The Company That In Just One Month...

- Was selected by the University of Pittsburgh for implementation of data base managed administrative applications as an element of their progressive "Campus of the Future" project...
- Was selected by one of the most prestigious graduate schools of business for a long term Computing Resource Management engagement...
- Was selected by Chester County, Pennsylvania, located on the rapidly growing Route 202 "High Tech Corridor" (*Venture*, Sept., 1983)...
- Was featured by *Barron's* (March 19, 1984) as the leading vertical market specialist to higher education and local government...and was endorsed by leading high technology brokerage firms as the latest recommendation on their high technology buy lists...
- Continued its record 40% growth...

Can you imagine the caliber of people who made that possible? Join us on the leading edge of computing technology for higher education and local government.

Meet with our Senior Management and key executives to discuss our opportunities for:

- ACCOUNT MANAGERS
- SENIOR CONSULTANTS Financial or Payroll/Personnel
- TECHNICAL DIRECTORS
- SALES/MARKETING MANAGERS

A successful MIS track record is essential; an entrepreneurial style is critical.

For your appointment, write or call: Manager, Professional Recruiting (800) 441-7247, SCT, Great Valley Corporate Center, Dept. CW-24, 4 Country View Road, Malvern, PA 19355. An Equal Opportunity Employer, M/F.

Systems & Computer
Technology Corporation
...On The Grow!

Systems Programmer

Due to continued expansion, Wisconsin Electric Power Company has an immediate opening at our Corporate Data Center for a Systems Programmer. We are currently positioning ourselves for an XA/3084 conversion as well as planning for the implementation of an Office Automation System.

To qualify, you must have a Bachelor's Degree with one to two years of experience in either of two areas: CICS and VSAM (with DISOSS and/or Data Base a plus) or MVS/SP in general (including JES2, SMP/E and ISPF/PDF; VM/HPO is a plus).

To join a skilled, dedicated staff in a state-of-the-art facility with the number one rated electric utility in the nation, send a detailed resume and cover letter to:

Jeanne S. Menzel
Wisconsin Electric Power Company
P.O. Box 2046
231 W. Michigan Street
Milwaukee, WI 53201
An Equal Opportunity Employer M/F/V/H

Programmer/Analyst IBM System 38

General Instrument has brought some of the most advanced technology for Optoelectronics to Palo Alto. Our totally integrated Optoelectronics Division, backed by a Fortune 500 corporation, has a challenging career opportunity for a programmer/analyst experienced with the IBM System 38.

Work with a team of IBM System 38 professionals to develop financial, manufacturing and marketing systems and telecommunications programs for our local and offshore operations. If you're a creative thinker who can take a system from design through implementation, you may be qualified. Experience with RPG III and on-line systems development required.

General Instrument's salaries and benefits reflect our commitment to leadership in Optoelectronics and to our people. Please send your resume to Jeanne Jones, General Instrument, 3400 Hillview Avenue, Palo Alto, CA 94304. We are an equal opportunity employer m/f/h.

GENERAL INSTRUMENT

IMS MTO

Southern California

With your talents and our relocation assistance, this is your chance to MAKE YOUR MOVE to Southern California.

You'll be stepping into an excellent ground floor opportunity at TRW's Information Services Division as an IMS Master Terminal Operator.

The responsibilities will include control and operation of our new IMS Fast Path applications. We require 2 years experience as an IMS MTO; CICS background is very desirable. This position will require a 3-day work week.

Our salaries and benefits are highly competitive; the opportunities for advancement—outstanding.

For immediate consideration, please send your resume with salary history to:

Deana St. John
TRW-ISD
505 City Parkway West
Suite 100
Orange, CA 92668

Equal Opportunity Employer

TRW

1,000 SUNBELT OPENINGS

D.P. - ROBERT MONTGOMERY

Prog. Anal. (3 plus yrs. mfg. CICS & COBOL)	TO: $32,000 NC location
Sys. Prog. (3 plus yrs. MVS or IMS)	TO: $40,000 SC location
Prog. Anal. (3 plus yrs. banking IMS & COBOL)	TO: $32,000 VA location
Sys. Prog. (3 plus yrs. NCP & VTAM)	TO: $40,000 NC location
Sys. Anal. (3 plus yrs. ins. appl. & COBOL)	TO: $37,000 TN location
Prog. Anal. (3 yrs. H-P & COBOL)	TO: $28,000 NC location

ENGINEERING - MIKE HUNTER

Sys. Mgrs. - 80/86-88 M68000	TO: $70,000
Sys. Engrs. - Micro/Op. Sys.	TO: $50,000
Sr. Software Engr. - VAX/VMS	TO: $42,000
Software Engrs. - 80/86-88	TO: $45,000
Software Engrs. - Telephony	TO: $60,000

Fox-Morris is the nations largest corporate owned co. with over 150 affiliates located throughout the nation. For a clear understanding of our clients needs call 919/872-2940 or send resume to:

FOX-MORRIS ASSOCIATES
3101 Poplarwood Court
Raleigh, NC 27625

DATA LINK

COME TO NEW ENGLAND

and see what we have to offer!

New England has skiing, sailing, mountains, beaches, a Courier and Ives atmosphere, and a professional climate that is very exciting; i.e., P/A's, S/P's, SW Eng's with experience in PDP, INTEL, HONEYWELL, IBM, WANG. A UNIX, C and graphics background is also desirable.

Send us your resume or call, and let DATA LINK introduce you to New England.

Our list of client companies is endless, and all fees, interviews and relocation expenses are paid by our clients.

DATA LINK
National Recruiting Consultants
Exeter Professional Building
Hampton Road, Exeter, NH 03833
(603) 772-5400

SYSTEMS PROGRAMMER

We have an immediate opening for a DOS/VSE Systems Programmer with at least 2 years experience. This position requires in-depth knowledge of CICS, VSAM, COBOL, BAL & JCL. A technical school degree and some experience with VM/SP would be a definite plus.. Responsibilities will include system generation, maintenance and applications support for production and tests VSE system.

We offer excellent salary and competitive benefits including our unique Paid Time Off program. Please submit resume and salary history to:

BETHANY ENTERPRISES, INC.
Human Resources
2224 W. Northern Ave., D-300
Phoenix, AZ 85021

An Affiliate of Baptist
Hospitals & Health Systems

Equal Opportunity Employer

COMPUTER/ELECTRONICS CONTRIBUTORS

DEVELOPMENT PROGRAMMER/ANALYSTS (50) .... $26 TO $45,000
Several Programmer/Analyst positions are available now . Openings range from Lead Programmer to Systems Support Analyst. Applications of interest are manufacturing (MRP, BOMP, CAD, Cost Accounting, Labor Reporting, etc.), Banking (DDA, Hogan, Remittance Processing, Credit Card, ATMS, Trust Accounting, CIF, CD's), Insurance (Life 70, Issue Com, Acturial, ALIS, PALIS, CFO, etc.), Contract Services (ADABAS, IDMS, Model 204, FOCUS, IMS, CICS). Environment includes NCR Criteron, Univac 1100, 3084/XA, 370/DOS/VSE, Burroughs, Datapoint 6600/ARC-RMS, DG, DEC 11/XXX. Technical programming background with COBOL, ASSEMBLER, NEAT, 'C', PASCAL, or RPG is required. Most of the positions prefer a degreed person.

MVS SYSTEMS PROGRAMMER .... TO $45,000
Join this growing corporation and be responsible for moving to a 3083 E16/XA environment. Prefer some ACF/VTAM/CICS/IMS/SMP experience also.

COMPUTER CAREER RESOURCES
84 N.E. Loop 410, Suite 403E
San Antonio, Texas 78216
(512) 349-3666

UNIX*/C

$25,000 to $50,000
APPLICATIONS & SYSTEMS

National Placement Leader
For UNIX/C PROF'Ls
500 OPENINGS NATIONWIDE
Call or send resume

J. ROGERS ASSOC
NJ (609) 896-8484
out of state 800-222-0596
123 Franklin Corner Rd-Dept C-D
Lawrenceville, NJ 08648

*UNIX is a trademark of Bell Labs

The EDP Specialist
Specializing in career placement of EDP personnel of all disciplines. Our nationwide clients offer opportunities spanning the full spectrum of the Data Processing and Software/Hardware Engineering Field.

THE TRIMBEC GROUP

Send resume, salary history and geographic preference to Adele Durhem, Data Processing Division, Drawer 40, Liverpool, N.Y. 13088.

(315) 451-4220

Software Engineers Systems Analysts Programmers $25,000-$55,000

Choice opportunities immediately available in Pennsylvania & national locations. BS, MS & PhD level positions. We have been placing DP professionals for 20 years, with many of the nation's leading companies.
All fees paid by client companies. Reply in strict confidence to Ann Scalese, Vice President.

WEIR PERSONNEL SERVICES, INC.
Box 1379, Reading, PA 19603
215-678-7812

UNIX*

National Registry
of UNIX* job
openings & professionals

P.O. Box 19949, Dept. CWU
Houston, TX 77224
Please send resume.

Scientific Placement, Inc.
800-231-5920
UNIX is a registered trademark of AT&T

HIRING?

More computer people read Computerworld than any other newspaper in the United States - more than half a million computer people every week. Among our 529,650 readers at user organizations, about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads).

No wonder Computerworld carries more recruitment ads for computer people than any other publication. To place your ad or to get a rate card with complete details on Computerworld Classifieds, call or write:

Classified Advertising
Computerworld
Box 880
Framingham, MA 01701

1-800-343-6474 ————————— 617-879-0700

MVS SYSTEMS PROGRAMMER

Rochester Gas and Electric Corporation, a major upstate New York public utility, is installing IBM 3083, 3725 communications controllers and 3380 DASD, using MVS/XA, JES2, ACF/VTAM, MSNF, ACF/NCP, CICS and TSO with ISPF/PDF.

Seeking MVS Systems Programmer with strong background in the installation and maintenance of MVS operating system and related products. Minimum of 3 years experience in MVS installation and maintenance, SMP, IOGEN, and IPCS required as are strong assembler programming skills. Experience in SMP/E, IOCP, INFO/MVS, INFO/ACCESS and ACF2 preferred. BS level of education preferred.

For additional technical information, contact Gary Dunkleberger, Manager, Information Systems Support Services, (716) 546-2700 or forward resume including salary history and requirements, in confidence, to Barbara Mestler, Employee Relations Department, 89 East Avenue, Rochester, NY 14649.

An Equal Opportunity Employer

MIS DIRECTOR

We are a major manufacturer and distributor, located in upstate New York, and are seeking an experienced individual to manage our corporate MIS department. The successful candidate should be a self-starter, capable of handling the selection and installation, of new hardware and systems. A minimum of several years experience in programming, a COBOL and RPG II background, plus the ability to interface with both senior and line management is preferred. We currently have a Univac 90/30 system and we wish to expand its applications and the role of MIS. We offer an excellent compensation/benefits package and a challenging opportunity. Qualified individuals should forward resume, including salary history and requirements to:

Ruth A. Smith
Crowley Foods, Inc.
145 Conklin Avenue
Binghamton, NY 13902

Computer Sales Professionals . . .

Territories Available Nationwide

If you want to stop bumping your head on your income ceiling . . .

Harris Can Make It Happen.

Harris is a $1.8 billion Fortune 200 company at the cutting edge of communications and information processing. For more than a quarter century we envisioned the advent of the Information Age, and today are one of the few companies able to provide totally integrated communications and computer systems.

Harris Information Terminals Group manufactures a variety of IBM compatible products including distributed data processing systems, interactive terminal systems and remote batch terminal systems. Here you'll find an atmosphere where an entrepreneurial spirit and technical excellence work in harmony.

We recognize that our continued success, in large part, is predicated on our ability to attract and retain outstanding sales talent. Consequently, we have developed a compensation package that affords you the opportunity to maximize your earnings capability right from the start. You'll receive a highly competitive base salary, a lucrative incentive program as well as the full complement of company paid benefits and expenses that you'd expect from a major industry leader. What you won't find at Harris is any ceiling on your commissions. In fact, your income will be limited only by your ability to produce.

The equipment you'll be selling has varying sales and payment cycles, so while you're working on big ticket orders, you'll be able to balance your income with a range of products with relatively short sales cycles.

If you have a proven track record in computer and/or computer peripheral sales, and are looking for a highly professional environment where you can maximize your income potential, we invite you to consider the following opportunities:

If you are unable to call, please forward your resume in confidence to: Mr. Joe Preston, Director National Sales Recruiting, Harris Corporation, Information Terminals Group, 16001 Dallas Parkway, P.O. Bcx 809022, Dallas, Texas 75380-9022

BALTIMORE, PHILADELPHIA, WASHINGTON D.C.
(Federal and Commercial)
CALL COLLECT (703) 448-5400:
Mr. George Bernardini, District Manager

NEW YORK CITY, NORTHERN NEW JERSEY
CALL COLLECT (201) 994-2020:
Mr. Anthony Fusarelli, District Manager

CHICAGO, DETROIT, KANSAS CITY, MINNEAPOLIS and ST. LOUIS
CALL COLLECT (412) 787-3700:
Mr. Wayne St. Clair, Regional Director

DENVER. SAN FRANCISCO, LOS ANGELES, PHOENIX, PORTLAND and SEATTLE
CALL COLLECT (303) 799-8600:
Mr. Doug Wahl, District Manager

ATLANTA, DALLAS and HOUSTON
CALL COLLECT (214) 248-3265:
Mr. Van Adamson, Regional Director

We are an equal opportunity employer M/F/H/V

HARRIS

IF IT'S HAPPENING IN INFORMATION TECHNOLOGY, IT'S HAPPENING AT HARRIS.

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies
and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions education and experience (including computers, models operating systems and languages) to either one of our locations Our client companies pay all of our fees We guide: you decide

RSVP SERVICES, Dept. C
Suite 700, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211, Dublin Hall
1777 Walton Rd., Blue Bell, PA 19422
(215) 629-0595

From outside New Jersey, call toll-free 800-222-0153

RSVP SERVICES
Employment Agents for Computer Professionals

DATA BASE ADMINISTRATOR

Lutheran Hospitals and Homes Society, a multi-unit health care system is seeking an individual to develop its Data Base Management function.

Minimum requirements are 6 years experience in systems analysis-design, a bachelor's degree and working knowledge of data base systems.

Excellent salary and benefits. Submit resume and salary requirements to:

Margy Kopp
Professional Recruiter
Lutheran Hospitals and Homes Society
Box 2087
Fargo, ND 58107
EOE

ASSISTANT DIRECTOR FOR ACADEMIC COMPUTING

Reporting to the Director of Computing Services, the Assistant Director for Academic Computing will be responsible for heading up the academic support area of the University's Computing Center. This position will be the main liaison with faculty.

Responsibilities include directing staff in providing a wide range of consulting services, evaluating software for academic applications and providing technical support for the academic community.

A Master's Degree in Computer Science or closely related field preferred. Strong managerial, organizational and interpersonal skills and a working knowledge of FORTRAN and PASCAL are required. Candidates should have at least 1 year's experience in direct user support in an academic environment. Experience with any of the following considered an asset: IBM43xx, DEC VAX, UNIX and microcomputers.

Millersville University is located in southeastern Pennsylvania less than 3 hours from New York City, Washington, DC and Philadelphia, PA. One of 14 universities in the Pennsylvania State System of Higher Education, the University enrolls approximately 6,000 students per semester primarily undergraduates.

Salary range is $25,600 to $34,875 based on experience and education. The University offers an excellent fringe benefits package. Interested applicants should submit resume showing education and experience, transcripts of all graduate and undergraduate courses and three letters of reference by July 13, 1984 to: Mr. Anthony Mordosky, Chairperson, Search Committee, Boyer Computer Center, MILLERSVILLE UNIVERSITY, Millersville, PA 17551.

Millersville University is an Affirmative Action/Equal Opportunity Employer encouraging women and minorities to apply.

MIS MANAGER

METRO, a successful international leader in the cash and carry wholesale business, has an exceptional opportunity for a professional to manage our data processing team in our central executive office in the Chicago area.

We are looking for an MIS Manager who will develop and direct MIS staff to meet responsibilities including the running of two IBM 4331 systems, directing a small team of program/systems procedures analysts, systems development, internal user interface, and training, within our central office. Also, our MIS Manager would have the responsibility of supervising and advising our data processing staff in our external warehouses.

We require a minimum of 8-10 years experience within the computer field and practical knowledge of COBOL, Assembler, CICS, VSAM, BTAM, DOS/VSE, JCL, Librarian, and Vollie. A masters degree in MIS/Comptuer Science is preferred.

If you qualify, we can offer you a competitive salary, comprehensive benefits package and a chance to grow with our organization. Please send resume with salary history in confidence to:

Hans J. Schuster
Vice President,
Finance/Administration

METRO

METRO CASH & CARRY, INC.
Executive Offices
250 N. Mannheim Rd.
Hillside, IL 60162
equal opportunity employer m/f

Application Systems Specialists

We are Freightliner Corporation, a major North American manufacturer of diesel trucks and the U.S. distributor of Mercedes Benz trucks. New products and an expanding market provide opportunities for you now... and in the future.

The following newly created positions at our Portland Data Center (IBM 3081, MVS, TSO, IMS, CICS) will keep you at the leading edge of application development. Introduce your skills and talents where they'll be used to the fullest... and be appreciated.

Systems Analyst

A seasoned individual to handle the analysis and IMS data base design of manufacturing and engineering applications. COBOL, IMS, TSO/SPF required.

Systems Specialist

User oriented, non-traditional senior programmer position to support engineering applications utilizing broad based skills. Knowledge of, or experience with, Fortran, Focus, COBOL, Basic, TSO/SPF, PC-DOS and Graphics. Familiarity with engineering terms and principles desired.

Programmers

Numerous opportunities for programmers with one or more years' experience. Applications are manufacturing and engineering oriented. All positions require COBOL experience in a large IBM environment (TSO/SPF, Panvalet, OS/JCL, etc...). Some require IMS DB/DC experience.

Sr. Programmer

A series 1 specialist with broad based hardware/software knowledge and experience in manufacturing and production applications. EDX and EDL required. Specific experience with Time and Attendence or Numerical Control Applications is a plus.

We offer excellent salary and benefits in a dynamic state-of-the-art environment. Join the center of action in Portland, Oregon. Relocation expenses are paid. Please send your resume to: **Paul Fulton/Freightliner Corporation, P.O. Box 3849, CW611, Portland, OR 97208,** or call **(503) 283-8927.**

An Equal Opportunity Employer
No agency referrals, please.

FREIGHTLINER
FREIGHTLINER CORPORATION®

System Developers
800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PHD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D. A. Redwine and ask for our free resume workbook & career planner.

Scientific Placement, Inc.
P.O. Box 19949 CW Houston, TX 77224 713/496-6100

UNIX is a trademark of Bell Labs

SYSTEMS ANALYST (879) - To provide technical support to Office of Management Information Systems to conduct analysis of managers information needs, design and develop software to be used in a decision support environment. Responsibility includes coordination with Data Base Administrator to ensure data availability, integrity and security of data base. Qualifications - systems analysis skills, COBOL programming skills, experience with IBM systems especially IBM 4341, IBM MVS, CICS. Personal communication skills. Prefer experience in data base environment and higher education. Salary - $25,971. Closing date June 15, 1984. Send letter of application and resume to Employment Office, Old Dominion University, 1509 West 49th Street, Norfolk, VA 23508-8570. AA/EOE.

DIRECTOR OF COMPUTER AND COMMUNICATIONS CENTER

Keystone Junior College seeks an individual to undertake the direction and management of the computer network system on campus and the communications system. The current network has a PDP 11/44 with the planned addition of a VAX system within the year and terminals and microcomputers throughout campus. The successful applicant should be creative not only in the technology of computers, but also in bringing users together to the end of supporting the colleges prime reason for being: the education of undergraduates, 65% of whom go on to four year institutions. Letters of application, resumes, list of references with telephone numbers, or nominations should be sent to: Nancy McGuire, Secretary, Computer Search Committee, Keystone Junior College, La Plume, PA 18440.

MANAGER OF NETWORK SERVICES

SYRACUSE UNIVERSITY is searching for a highly motivated individual to be Manager of Network Services in its Academic Computing Center.

Duties and responsibilities of this position include:

- overseeing ongoing maintenance and growth of existing large mini/micro/terminal network involving 3 IBM 4341's with VM/CMS and MVS, Series/1, 3705, 327x's, various ASCII terminals, NetOne/Ethernet and WANGNET
- defining, configuring, and installing future network(s)
- overseeing the communications hardware repair operation
- participating in definition and implementation of the University's overall telecommunications upgrade.

Applicants should have a minimum of 5 years experience with computer communication protocols, hardware and software. Knowledge of computer networking essential. Supervisory experience desirable. Master's degree in computer science, math or engineering or equivalent combination of education and experience required. Salary is negotiable and dependent upon experience.

Syracuse University's benefits include competitive salaries, advanced degree opportunities, dependent scholarships, and generous vacation and retirement plans. Send resume to: Syracuse University, Personnel Department, Skytop Office, Syracuse, NY 13210. Closing date for applications is June 29, 1984.

SYRACUSE UNIVERSITY
An Equal Opportunity
Affirmative Action Employer

PROGRAMMER/ ANALYST

Immediate opening for experienced Programmer or Prog./Analyst. Knowledge of IBM DOS/VSE operating system. JCL and JECL required. Analytical skills with some design experience preferred. Write and maintain programs in RPG II and BAL. Current system IBM 4331. Programming is on-line using ADR's Vollie and Librarian programs. Shop converting VSAM files to ADR's DATACOMM DB anticipating delivery of 4th GL "IDEAL" in June. Salary start 22 K to 26 K depending on qualifications. Contact:

Personnel Dept.
Montana Deaconess
Medical Center
1101 26th Street So.
Great Falls, MT 59405
(406) 761-1200 or
1-800-548-9970.

An EEO Employer.

COMMUNICATIONS SPECIALIST

Consulting group of Big 8 CPA firm has an urgent need for an expert in all aspects of IBM data communications. Manager position with partnership potential in 1-3 years. Salary completely open.

ROMAC®
4410 IDS Center
Minneapolis, MN 55402
612-333-0126

SUNBELT S/38
FEE PAID

If you have one or more years S/38, RPG III experience, we'll contact our favorite shops listed below. Call or write today even if you don't have a resume.

NC = 98 Shops
VA = 83 Shops
SC = 47 Shops
GA = 86 Shops
TN = 81 Shops

State goals, salary, # years experience to **Jane Green, the Southeast's S/38 recruiter.** The best companies call her daily seeking top-notch programmers & analysts.

Personnel Placement, Inc.
P.O. Box 1815, Burlington, NC 27216
Day: 1-919-584-5591
Night: 1-919-227-2736

SYSTEMS PROGRAMMER

Three years experience preferred on MVS System, JES2, TSO, SMP/E, IMS and 308X System.

Send resume to:
ALPHA BETA COMPANY
777 S. Harbor Blvd.
La Habra, CA 90631
Attn: Technical Services
An Equal Opportunity Employer

NEW ENGLAND NEEDS YOU!

TELECOMMUNICATIONS ANALYST

Design, develop, enhance PBX, Satellite, SNA and LAN networks for major international company. HW/SW evaluation, performance analysis, RFQ preparation, great communication skills needed.

Salary Negotiable

IMS

Experienced IMS DBA's and internals pro's needed for major development projecs by Fortune 100 company. Manufacturing/financial background, good communication skills needed.

$35,000-$60,000+

ROBOTICS

DECNET communications linkup for 'Factory of Future' using SNA gateway, distributed d.p. on DEC VAX. Heavy manufacturing experience and good communication skills a must. Salary Negotiable

All positions offer technical challenge, promotion opportunities, top benefits including relocation in great New England settings. Call Dennis Wry or Vic Gottheimer collect at (203) 278-5840 or send resume to:

RJS ASSOCIATES
RJS ASSOCIATES
241 Asylum Street
Hartford, CT 06103

COMPUTER GRAPHICS SPECIALISTS

Manage exciting projects in the Graphics Production Center of San Diego-based ISSCO, the world's leading supplier of high quality presentation graphics software.

Candidates must have a graphic design background, know audio visual techniques and be experienced users of ISSCO's TELL-A-GRAF or DISSPLA software.

Contact, in confidence:

ISSCO
Employee Relations Department
10505 Sorrento Valley Road
San Diego, CA 92121
EOE M/F/H

MOVE TO FLORIDA NOW

Why spend another winter in the cold? We have excellent opportunities throughout Florida for PROGRAMMER/ANALYSTS and SYSTEMS PROGRAMMERS. Most of our opportunities are in large IBM, OS/MVS environments using COBOL and/or Assembler. Database or CICS exp helpful. Heavy needs in the BANKING industry.

Also need PA's with System 38 experience - good user interface required. For consideration send your resume or call:

Management Recruiters of St. Pete
7901 4th Street North, Suite 307
St. Petersburg, FL 33702
(813) 577-2116

PROGRAMMER/ANALYST

Programmer/Analyst needed to design, develop, test, and integrate software for telephone facilities management systems. Analyze business procedures and problems to refine data and to convert it to progammable form for electronic data processing. Study existing data handling systems to evaluate effectiveness and develop new systems to improve workflow as required. Requires a Bachelor's of Business Administration or Computer Science and 1 year experience in job offered or 1 year in related software development experience or will consider a combination of 6 months additional academic course work and 6 months experience in lieu of 1 year experience. Must have software development experience in Data General (AOS) and Prime (PRIMOS) computers. Must have knowledge of COBOL, FORTRAN and PASCAL programming languages. Must also have experience with accounts receivables, payables, general ledger and order entry as applied to telephone facilities management systems. 40 hour work week. $23,000 per year. Apply at the Texas Employment Commission, Dallas, TX. TEC Job Order #3384870. Ad paid by an Equal Employment Opportunity Employer.

FLORIDA

Let us assist you in your search for opportunities in the #1 growth state. Our staff consists of former Data Processing managers who understand your career needs and speak your language. If you appreciate and desire a knowledgeable, professional approach with your career then contact:

COMPUTERPEOPLE
5729 N. Hoover Blvd., Suite 204
Tampa, Florida 33614
(813) 885-6135

We Serve Computer Professionals Exclusively-
And That's Important To YOU!

Visiting San Francisco?

Let us know when you are arriving and we may arrange that you stay forever!

If you are an experienced **Data Processing Professional** with skills in Large Systems or Minis, **Data Base** or **On-Line Systems**, consider a move to the beautiful **San Francisco Bay Area.**

LOGICAL OPTIONS
Incorporated Agency **Est. 1975**
One Market Plaza, Spear Tower, Suite #2014A
San Francisco, CA 94105 • (415) 777-3900

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $128.10 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $256.20 per insertion. Extra space is available in half-inch increments and costs $64.05. Box numbers are $15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired:________columns wide by________inches deep.

Issue Date(s):____________________

Section:____________________

Signature:____________________

Name:____________________

Company:____________________

Title:____________________

Address:____________________

Telephone:____________________

Send this form to:

COMPUTERWORLD
CLASSIFIED ADVERTISING,
375 Cochituate Road, Box 880,
Framingham, MA 01701

FIELD ENGINEERS

Dataserv Computer Maintenance is expanding nationwide. We have immediate openings now!

These are key positions and provide excellent opportunities that could lead to further promotion in a fast growing company. We offer an excellent compensation plan and fringe benefits for experienced individuals. Your potential for personal advancement with our $130 million company is the greatest now as we expand.

Positions now available in:

North Haven, Conn. - Field Engineer.
Immediate opening for experienced Field Engineer to service and maintain **IBM** 327X terminal equipment.

Midwest location - Field Engineer.
Immediate opening for experienced Field Engineer for support of **IBM** 5520 word processing system.

Dataserv will have additional opportunities soon for experienced field engineers and technical specialists in major cities throughout the United States. If you're considering a change, contact Dataserv for a review of our company and your career goals.

For immediate confidential consideration call TOLL FREE - 800-328-6729 or send resume to: Bev Walters, Dataserv Computer Maintenance, Inc., P.O. Box 3003, Hopkins, MN 55343.

An equal opportunity employer.

dataserv

Sr. Systems Analyst

Commercial & Scientific Accounts

Perkin-Elmer, a leading designer/manufacturer of state-of-the-art minicomputers used in commercial, scientific, and industrial applications, has an exceptional career opportunity in our Los Angeles area sales office.

As an integral part of the sales team, you will be responsible for all technical aspects of the sales effort. This will include hardware/software configuration, system performance analysis, technical presentations, equipment demonstrations, and competitive benchmarking. This position requires a B.S. degree in Computer Science (or equivalent) and at least 5 years experience in a commercial or computer vendor environment. Knowledge of computer architecture and FORTRAN is a must. Proficiency in UNIX/C and/or SNA a plus.

As a Fortune 500 leader, Perkin-Elmer offers excellent salaries and an outstanding benefits package that includes profit sharing, stock purchase, major medical/dental, and retirement plans.

For prompt consideration, please send resume including salary history to: Larry Lane, The Perkin-Elmer Corporation, Data Systems Group, 6033 West Century Blvd., Suite 200, Los Angeles, CA 90045.

An Equal Opportunity Employer M/F

PERKIN-ELMER

Our most powerful software is not for sale.

We're talking, of course, about the brains behind the brawn of the most powerful DBMS for IBM mainframes – the brains behind MODEL 204. And the PC/204, a software link which allows IBM PC users to access mainframe databases – easier than they can say a-b-c.

Which is easy-to-say. But not easy-to-do. So, at Computer Corporation of America, we value people who comprehend complexities, and can translate them into understandable, usable tools to help managers manage and analysts analyze. Without ending up in analysis.

Maybe that's why our software is selling so well. Because we don't sell our customers – or our own people – short.

SYSTEMS PROGRAMMER/ANALYST

DENVER

Within the Research and Systems Division of our **Denver, Colorado** facility, you will define requirements as well as design, develop, test and support the initial operation of database application software for an IBM environment with MVS, CICS and MODEL 204. Utilizing COBOL, FORTRAN and some Assembly language, you will develop formal software specification documents and test plans. BS/MS in CS and knowledge of IBM, COBOL, FORTRAN, Assembly language and JCL are required. Must have DBMS training or work experience and at least 1 year of application system development experience in an IBM environment. CICS and M204 experience a plus.

Position requires U.S. citizenship and involves special background investigation. Special Bonus Plan available for individuals with current special access and/or recent background investigation.

(SR.) TECHNICAL CONSULTANTS

DOMESTIC & INTERNATIONAL

Positions are available in our New York, New Jersey, Cambridge, Denver, Connecticut and Washington, DC branch offices for marketing-oriented professionals to get involved in M204 pre and post sales support. Will contribute to customer satisfaction and revenue growth by participating in presentations, proposal preparation, trials/benchmarks, user requirement analysis, customer training and education, and installation. BS/BA or advanced degree plus 4-8 years' IBM Systems/Applications software experience, with heavy emphasis on Operating Systems, Database (IMS, IDMS, ADABAS, etc.) and TP (CICS, VTAM, TCAM, BTAM). Knowledge of database design concepts with hands-on applications experience and solid communication/presentation skills essential. Frequent travel involved.

(SR.) TECHNICAL SUPPORT CONSULTANT

Responsibilities: customer technical support for all commercial products. Debugging, source and object code maintenance, benchmarks, advanced technical training, in depth customer problem resolution, and project management.

Requirements: BS/CS preferred, with 4-8 years' technical experience. System programming (CMS, DOS, OS), DBMS and BAL (IBM) background necessary. Application development and user/customer support experience desirable.

PROJECT MANAGER and SYSTEMS PROGRAMMERS

CAD/CAM/DBMS

Develop central repository for all CAD/CAM data needed during a product life cycle. CCDBMS will provide all data storage management and access facilities required to support information requirement of CAD/CAM applications systems. Project Manager will head a staff of 15. Requirements include BS/MS in CS, knowledge of databases and/or systems design in IBM environment, with CAD/CAM experience highly desirable. In addition, Project Manager will have a minimum of 4 years' experience in leading a successful DBMS implementation.

Please send your resume, specifying position of interest, to Kathleen Hubbard, Dept. CW61184, Computer Corporation of America, 4 Cambridge Center, Cambridge, MA 02142.

A Crowntek Company An Equal Opportunity Employer M/F

Computer Corporation of America

DP POSITIONS SEATTLE/PORTLAND

MVS. Sr. Systems Programmer	$42K
Sr. IMS Systems Prog. Systems Performance-data base consultant to applications group.	42K
Sr. Programmer/Analyst Financial app. CICS/DL1 on line interactive.	32K
Programmer/Analyst CICS/DL1 or VSAM on-line dev.	28K
Sr. P/A IMS applications dev	to 40K
Data Admin. Analyst data resources Mgmt local DP design.	to 45K

Please forward resume immediately to:

HOUSER, MARTIN MORRIS & ASSOC.
(206) 453-2700
C-90015, 1940-116th Ave. N.E.
Bellevue, WA 98009

COMPUTER PROGRAMMING, SYSTEMS AND ENGINEERING PROFESSIONALS

National employment resources at your service. Through our screened and selected employment affiliates, we'll get your resume to employers with applicable job openings in your targeted geographic areas. Openings for systems software and all kinds of applications programmers and analysts, EDP marketing and support reps, hardware and software engineers, EDP technical writers, etc. A quick and easy way to cover the job market. No fee, contract or obligation.

At least two years of professional experience required. U.S. citizens and permanent residents only. Send one resume along with current and desired salary, desired location and a summary of your computer hardware and software experience to:

NATIONAL CONTACT NETWORK, INC.
Ref. CW, 3100 West Chapel Avenue
Cherry Hill, N.J. 08002 / (609) 667-4080

Put the best of Southern California on your horizon.

*The ideal career environment — one that combines technical challenge in modern facilities with the best of **Southern California** living in unspoiled, oceanside **Orange County**— could be yours with the world-leading Burroughs Corporation.*

Our Systems Development Group is growing so fast, we're opening a new software development center in Lake Forest, CA to complement our Santa Ana, CA center. Our programming opportunities are exceptional at these locations, in the following career employment areas:

System Software

- ***Compilers***
- ***Computer Architecture***
- ***Computer Network Architecture***
- ***Data Communications***
- ***Distributed Processing (Local & Wide Area Networking)***
- ***Interactive Debugging Tools***
- ***Operating Systems***
- ***Work Station Systems***

Environmental Software

- ***Advanced Database Management (Data Models, Query Languages & Data Dictionaries)***
- ***Interactive Development Aids***
- ***Message Control Systems***
- ***Program Generators***

Technical Writing

- ***User Manuals for Software Products***

Programming positions require a BS or MS in Computer Science and an orientation to medium or large systems programming in any of the above listed areas. Writing positions require a BS degree in Computer Science, Technical Writing or Journalism combined with background in formal communication techniques and an understanding of programming languages.

Consider a community that presents an everyday invitation to outdoor recreation. . . consider a growing industry leader that offers excellent salaries, benefits and relocation assistance. . . consider Burroughs. Please send your resume to:

Human Resources Department
Burroughs Corporation
Systems Development Group
Dept. CW0611VS
3519 West Warner Ave.
Santa Ana, CA 92704

An Affirmative Action Employer M/F

Burroughs

THE QUESTION ISN'T WHO'S BIGGER.
IT'S WHO'S BETTER.

DATA PROCESSING MANAGER. Innovative professional needed to manage the data processing activities of the City of Olathe, Kansas, a rapidly growing community of 50,000 located in the Kansas City metropolitan area. Responsibilities include long-range planning, budgeting, personnel administration and organizational development.

Currently, Olathe's hardware and software configurations are IBM 4300 plug compatible with IBM OS/VS1 and VM systems, SAGNA ADABAS data base manager, SAGNA COM-PLETE teleprocessing monitor, SAGA NATURAL, IBM RPG and PL1 programming languages and graphics.

Degree in Business Administration or Computer Science with emphasis in data processing management, 5 years data processing experience including 3 years in a supervisory capacity and 2 years as a programmer/systems analyst preferred. Must have knowledge of business systems such as accounting, payroll, billing and collections. Familiarity with Software AG of North America (SAGNA) desirable. Must be up to date on latest technology and have ability to deal effectively with people.

Beginning annual salary range: $30,000-$40,000 with excellent fringe benefits including retirement plan and paid health and dental insurance.

Send resume or letter of inquiry in confidence to: **Personnel Department, City of Olathe, P.O. Box 768, Olathe, Kansas 66061. Closing date: July 2, 1984. EOE M/F/H.**

DIRECTOR OF TECHNICAL SERVICES

$39,603-48,131 depending on experience and qualifications; liberal fringe benefit package includes 6.5% retirement contribution (County now offers reciprocity with PERS). Department head position responsible for data processing, radio and microwave communications, telephone systems, word processing; Staff of 43. $3.1 million budget, $921,000 revenue, $1.2 million equipment budget. Requirements equivalent to BS degree in Business or Public Administration, Computer Science or related field and 5 years recent management, data processing, administrative experience including 3 years in a supervisory capacity. Beautiful Central California Coast location. Call (805) 549-5959 for additional details.

Submit County application form to Personnel Office Room 384, County Government Center, San Luis Obispo CA, 93408 by June 29, 1984. (805) 549-5959. AN EEO EMPLOYER.

System Analyst/Programmer

General Contractor located in the Pacific Northwest seeks an individual experienced with IBM System 34, Telecommunications, Micro Computers and RPG II language. The successful candidate must have a minimum of three years experience and advanced educational background in computer science.

We offer a comprehensive benefits program and salary commensurate with experience and qualifications.

Send resume to:

TODD BUILDING COMPANY
P.O. Box 160
Roseburg, Oregon 97470

SOFTWARE ENGINEERS $30,000-$60,000

Investigate the 140 immediate positions to elevate your career within the software engineering field Positions are available in the East. Midwest. and South. BSEE or BSCS is required. along with experience developing operational software for embedded computer systems.

You will receive a professional. "no-hassle" approach to advancing your career. and you will be dealing with an industry leader serving since 1952.

For immediate action. send your resume with salary history and relocation preferences to Dale Mayhall or Michael Kite

BONE PERSONNEL, INC.
2008 Ft. Wayne Bank Bldg.
Ft. Wayne, IN 46802
219-424-4466

LARGE SCALE
Honeywell
COMPUTER PROFESSIONALS

Data Image is looking for people with experience in:

- **GCOS 3**
- **GCOS 8**
- **DMIV-TP**
- **GRTS-II**
- **DNS**

SUNBELT LOCATION

data image CORPORATION

R. L. Braa 3736 Eubank NE
Albuquerque, NM 87111
(505) 294-4094

DIRECTOR OF COMPUTER SERVICES

Responsible for providing all central academic and administrative computing services in a two year suburban community college of 30,000 students. Environment includes over 175 terminals and APPLE's IBM and TRS-80 microcomputers plus IBM 4341. HP3000, DEC PDP 11/34 (CLSI supported), Wang 140, and use of several national networks. Position reports to VP of Planning and Information and works with Computer Service Management Committee (Presidents, Provosts and VP's) and provides coordination with Administrative Systems Users Advisory Committee and Academic Computing Users Advisory Committee. Bachelors degree, Master or DR degree desired and 5 years of responsible experience in an intermediate or large system environment preferrably at a college or university are required. Salary based on education background and experience with a competitive benefits package offered. Completed application including resume official transcripts, references, and supporting materials and salary history requirements must be received no later than July 1, 1984 by: Director of Personnel, College of DuPage, 22nd and Lambert Road, Glen Ellyn, IL 60137. (312) 858-2800 ext. 2460. Equal Opportunity Employer M/F

$30 - $40 PER HOUR CONTRACT PROGRAMMING

Computerware, Inc., a nationwide DP contract service, has continuing needs for Programmers and Software Engineers of all disciplines. Most critical current needs include:

- DECNet network communications software specialists, Texas location, rates to $40/hour.
- Telephony Programmers, call processing experience, Florida location, rates to $35/hour.
- PARS programming experience, Texas location, rates wide open.

Call or send resume to:
Computerware, Inc.
12901 Nicholson Rd. #200
Dallas, TX 75234
(214) 620-2091

DATA SECURITY OFFICER

Progressive Southern California data processing organization is seeking an individual to administer its data security program. Requires experience in the administration of a computer system data security program and in an IBM 370/158 or larger installation. SALARY - Up to $41,784/yr. plus $300 per mo. executive benefit plan. Apply immediately to:

COUNTY OF SAN BERNARDINO - PERSONNEL DEPT. - 157 W. 5th ST., SAN BERNARDINO, CA 92415-0440 (714) 383-2061.

EOE m/f/h

WANTED SYSTEM ANALYST AND PROGRAMMER/ANALYST HP3000 SHOP

System Analyst with 5+ years experience, good communication, analysis and design skills. Programmer/Analyst with at least Associate Degree and 1 year of experience. HP3000 experience a definite plus. Send resumes with salary history to:

Manager of Information Systems
P.O. Box 863
Centralia, WA 98531

PROGRAMMERS

Securities application experience required. IBM VM/CMS, C Language and relational database knowledge helpful. Salary and benefits commensurate with experience.

Koch Systems
Corporation
(415) 567-0424

SYSTEMS ENGINEER/FINANCIAL

Devise and expand systems for financial forecasting and investment projections for stock and commodity brokers. Create computer models, flow charts and specifications for programmers. Conduct cost benefit analysis. Must know FORTRAN and COBOL and have prior experience creating financial computer models. Requires MS in Economics or Engineering and 2 years experience or 2 years related experience in financial and budget planning involving systems analysis. $2500 per month. Los Angeles area. Send this ad and your resume to Job Number 9100, P.O. Box 865, Sacramento, CA 95804 no later than July 11, 1984.

PROGRAMMER/ANALYST SYSTEM 38

U.S. CAPITAL CORPORATION, one of the nation's largest mortgage banking and resort condominium development companies is seeking a Programmer/Analyst for its corporate headquarters in Columbia, S.C. Major responsibilities will include the development and installation of financial and marketing systems. Must have background in design and programming with 1-3 years IBM system 38 experience. RPG III, CL, COBOL, and knowledge of display info facility desired. Send confidential resume including salary history and requirements to:

Director of Personnel/CW
U.S. Capital Corporation
P.O. Box 11506
Columbia, SC 29211

EOE

DALLAS

MGR. TECH. SVCS.

Must have strong technical history in large MVS environment with current management duties and "business perspective." Suburban location. To 52K.

2720 Stemmons Frwy., 1207F
Dallas, TX 75207, (214) 637-6360

DATA PROCESSING CAREERS inc

BANKING/SAVINGS & LOAN "ANALYST"

As an analyst in a specialty area of a Bank or S&L, you've gained the type of expertise our clients are searching for. If you are knowledgeable in an application area in installment, D.D.A., C.I.F., P.O.S., General Ledger, Trust, Fixed Assets, A.T.M., Bank Card, or others, we may have an active opportunity waiting for you. So, whether you want to move across town or across the country, you'll need the service we can provide, quietly and exclusively.

Andy Park -919-378-1261
Banking Division
Adkins and Associates, Limited
P.O. Box 16062
Greensboro, North Carolina 27406

NCC 1984

The National Computer Conference is the biggest and most important conference in the world and it is going to be held July 9-12, in Las Vegas, Nevada this year! The NCC issues will have a readership of over 500,000 readers. This could be one of your smartest advertising moves of the year. Computerworld is giving you the opportunity to reach the show's attendees with three issues:

PREVIEW - July 2nd
SHOW - July 9th
WRAP-UP - July 16th

Our open line rate is $9.15 per line and the minimum ad size is 2 column inches (1 column x 2" at a price of $256.20). We are $128.10 per column inch. Send us camera-ready copy (negative or velox) or copy to be typeset by us at no extra charge. Enclose any logos, artwork, or borders that you want to use in your ad. We also have a team of ad takers that will accept simple copy over the telephone.

For more information call or write:

COMPUTERWORLD
Classified Advertising
375 Cochituate Road
Box 880
Framingham, MA 01701

(617)879-0700
(800)343-6474

Telecopiers: 410 451

SALT LAKE CITY

Data Base Analysts

Analyze, design, and build large mainframe database systems in IBM IMS DB/DC environment. Perform data base implementation including generation of PSBs, DBDs, ACBs, and MFS blocks. Two to four years experience in data base physical design, reorganization, recovery, and performance monitoring. Experience with TSO, SPF, JCL required. Background in ADF, UCC-10 Data Dictionary, Mark IV, and INQUIRY/IMS helpful.

IMS Systems Programmer

Install and maintain IMS and related products. Support IMS systems in doing SYS GEN's, data base recovery, and data base security. Work closely with other system programmers, data base administration, and operations to ensure proper data base system operation and performance.

Programmer/Analysts

Provide support to major LDS Church programs. Background in large mainframes (IBM 3081 using IMS VS, ADF, COBOL and MARK IV), minis (IBM System 38 using RPG III; ALTOS using OASIS, CONTROL), micros (IBM PC and XT using MS-DOS, DBMS, BASIC) and other high-level languages. Urgent need to develop, maintain, and install systems in locations worldwide. Background needed in Fortran and Assembly on small computers. Experience with foreign languages and cultures helpful.

Applicants must have knowledge of and adhere to the major principles and programs of the LDS Church. High motivation and a desire to contribute to the Church is required.

THE CHURCH OF
JESUS CHRIST
OF LATTER-DAY
SAINTS

Contact:
Personnel Department
14th Floor
50 East North Temple
Salt Lake City, Utah
84150
(801) 531-2873

Manager Technical Support Center

Be part of the exciting new high-tech product advances at NCR.

In this new, highly visible position, combining technical and marketing skills, you will manage hardware/software technical support professionals in third party development of hardware and software packages for the NCR Personal Computer. Reporting to the General Manager, you will also be involved in product demonstrations-/promotions to major customers and dealers. In addition, the Technical Support Center provides on-going software support for NCR's PC customers.

Your background should include a BSEE/BSCS, MBA preferred; and experience in software development with a proven track record in marketing.

Salary is commensurate with experience. Benefits are excellent. And the location near Greenville is ideal for working and living. Send your resume with salary history/requirements to: **Ms. Terrell Isaacs, Employment Manager, NCR Corporation, Dept. J-56, 1150 Anderson Drive, Liberty, South Carolina 29657.**

NCR
1884-1984
Celebrating the future

An equal opportunity employer

TECHNICAL WRITERS/EDITORS

At Data General, we realize that technical communicators need challenge, and we're willing to give it to you. As part of our hardware publications group, you'll support one of the strongest and most dynamic product lines in our industry, from PC's to superminis, in a climate where ideas are welcomed and initiative rewarded.

EDITORS

We have several openings for accomplished editors to help us publish pre-sales literature, technical manuals, commercial books and brochures. The opportunities are as broad as your interests and strengths—from copy and literary editing to rewriting, development and planning.

Requires a BS or BA with a minumum of 2 to 5 years experience in publishing or high-tech. Computer familiarity is an asset. The ability to manage books through production is essential.

WRITERS

We are also looking for hardware writers to research and write our pre- and post-sales manuals, from a range including technical references, programmer's references, operator guides and system introductions. You'll work closely with one of the best development teams in the business and have ample opportunity to build your own area of expertise or grow new ones.

Requires a BS or BA and a minimum of 2 to 5 years experience as a hardware writer in the computer (or a related) industry. Familiarity with computer systems and digital logic a definite advantage.

The compensation for these positions is highly competitive with the electronics industry and it will reflect your experience.

Send your resume, indicating salary history and requirements to Christine Manna, MS137-B72, Data General Corporation, 4400 Computer Drive, Westboro, MA 01580. Investing in people to make equal opportunity employment a reality.

Data General
careers a generation ahead.

DIRECTOR, UNIVERSITY COMPUTER CENTER

The University of North Florida is seeking applications and nominations for Director of University Computer Center. The Computer Center serves both academic and administrative users. The University Center serves both academic and administrative users. The University utilizes an in-house IBM 4341 mainframe for instruction and research and is an RJE center to an IBM 3081, 3033N and 4341 for administrative computing. In addition, the campus has various microcomputer laboratories and an IBM 5520 word processing network.

Responsibilities include coordination of all computing activities, budget management, and supervision of an 18 member staff. Applicant should possess knowledge and understanding of a multi-user on-line environment. A Bachelor's degree in Computer Science, Mathematics or related field plus seven years experience, three of which must be in a managerial capacity, are required. A Master's degree in Computer Science or related field may be substituted for two years experience. Salary range: $30,000-35,000. Anticipated starting date: Aug. 1984.

Applications must be received by July 2, 1984. Send cover letter and two copies of a current resume to Mr. Richard Crosby, Chairman, Search Committee, University of North Florida, Jacksonville, Florida 32216. Provisions of Florida's "Government in the Sunshine" and Public Records laws will be followed. The University of North Florida is an equal opportunity/affirmative action employer.

TECHNICAL TRAINING INSTRUCTOR

Tymshare, a leader in the management of computerized information and communications services, has an immediate opening for an experienced instructor in its Fremont, California facility.

You will use your technical knowledge and expertise to train personnel for our rapidly expanding computer maintenance organization. Experience instructing maintenance of computer systems, and peripheral equipment is required.

The ideal candidate will be offered a competitive salary and a comprehensive benefits package. For immediate consideration, please send your resume and salary history, in confidence, to Tymshare, Inc., Technical Training, 39100 Liberty Street, Fremont, CA 94538; Attn: Liz Johnson.

TYMSHARE
McDonnell Douglas

m/f/h/v

Equal Opportunity Employer

WHO'S WINNING IN THE SOUTHWEST? COMPUTER ASSOCIATES. WINNING IN SOFTWARE SYSTEMS SALES & DEVELOPMENT.

We have 75% of the Fortune 500 industrial corporations as our customer base. In order to keep pace with our high growth rate in the Southwest, Texas is our newest base of operations.

WHO'S ON TARGET? HOUSTON, and DALLAS.

We have an immediate need for SOFTWARE PROFESSIONALS to join our sales and marketing field force in our Houston and Dallas regional offices.

SYSTEMS ENGINEERS/SALES MARKETING TECHNICAL SUPPORT TEAM

Take-charge individuals who have the technical know-how to effect new product installations, and the communications/sales marketing ability to ably demonstrate systems utilization to our customers. A solid, 2 years' experience in an OS or DOS environment is required.

SOFTWARE SALES

High achievers to meet and exceed quotas to sell our software systems to the IBM mainframe environment.

Computer Associates International, Inc. is a multi-national corporation with a global record of service and growth. We design and develop products in 3 major software categories: Resource Management, Resource Measurement and Programmer Productivity. We offer highly competitive salaries, commission and an outstanding compensation package. If you share our zeal for growth and development, join the Computer Associates team of software professionals. Computer Associates is expanding in all our U.S. territories. For immediate consideration; please send your resume to: **Professional Recruitment, COMPUTER ASSOCIATES INTERNATIONAL, INC. 125 Jericho Turnpike, Jericho, New York 11750** An Equal Opportunity Employer M/F/V/H

El Segundo, Pasadena, Sausalito, CA; Phoenix, ARIZ; Des Plaines, IL; Middleburgh Hts., OH; St. Louis, MO; Lexington, MA, Atlanta, GA, Jericho (L.I.), NY Headquarters.

DATA CENTER DIRECTOR

Responsible for multi-faceted, medium scale computer center. Individual should possess education/experience in computer systems design and development, computer operations and telecommunications. Management experience and knowledge of criminal justice system desirable. Annual salary begins at $32,000. Submit resume to:

Florida Department of
Law Enforcement
Division of Criminal Justice
Information Systems
P.O. Box 1489
Tallahassee, FL 32302

Affirmative Action Equal Opportunity Employer

HOGAN

Projects Leaders, Analysts, Programmers

Our HOGAN Specialists are currently staffing several shops in the southeast and west. If you have a HOGAN or heavy banking background and desire these areas please mail us your resume or call collect:

Executive Consultants
1600 Fairfield, Suite 102
Shreveport, LA 71101
(318) 222-1000

PROJECT MANAGER Banking

Our client, a prominent commercial bank, needs a project manager. This person will direct programmer analysts and coordinate banking applications. Candidates must offer at least six years of DP experience including an IBM mainframe environment, COBOL, software installations. Assembler and CICS are helpful. Candidates must demonstrate strong skills in communications, leadership, and project planning. Competitive compensation package. Management has retained us and pays our fee. For confidential consideration send resume with salary history to Ms. R.C. Everett.

Personnel Incorporated
2626 Ruan Center
Des Moines, IA 50309

SENIOR PROGRAMMER

Morton Thiokol, Inc. a Chicago based manufacturer and marketer of Specialty Chemicals, High Technology Propulsion Systems, Salt and Household Products is seeking a qualified senior level Programmer with:

- 3-5 years experience using COBOL, OS/MVS JCL and TSO or CMS
- 1-2 years CICS
- Exposure to IMS
- Knowledge of human resource-type applications

Competitive salary and benefit package is available to the qualified candidate. Send resume and salary history to:

J. Mueller
Morton Thiokol
110 North Wacker Drive
Chicago, IL 60606

TAMPA, FLORIDA PROGRAMMER/ANALYST

Fast growing Tampa based corporation is converting from an NCR 8565 to an IBM 4341-2. We need an individual who has VRX, MVS, and COBOL experience. Competitive salary and benefits.

Submit resume to:

Moore McCormack Cement
PO Box 23965
Tampa, FL 33630
Attn: Nelson Capaz
(813) 933-6711

FLORIDA CONNECTION

Bank Data Processing

Gulf coast location. New data center need 2 yrs. MVS Cobol and one of the following: Loans, Deposits, ATM's, ODS. Hogan a plus. To $35K.

Systems Programmers

Any exp. w/ MVS, IMS DB/DC, ACF/VTAM, CICS/VS, RAMIS, VM. Salaries to: $40K.

P/A Cobol or PL-1, IMS DB/DC	to $36K.
DBA IMS or IDMS DB/DC	to$42K.
RACF Security Manager	to$37K.
P/A "C", X.25, DBMS	to$40K.

AVAILABILITY, INC.
813/872-2631
Dept. C, P.O. Box 25434
Tampa, Florida 33622

TANDEM Expertise?

Call or send resume to:
Mr. Neil J. Owrutsky
Director, Information Services

ENTRÉ COMPUTER CENTERS

1951 Kidwell Drive, Suite 400
Vienna, VA 22180
(703) 556-0800

ST. LOUIS MANAGER OF EDP AUDIT

Major National service organization based in St. Louis seeks an experienced EDP Audit Manager. Will work in a state of the art IBM environment and direct 2-3 other EDP Auditors. Requirements include BS degree, Hogan exposure and IBM background. Excellent benefit package. Salary depends on experience.

Randy Pace or Warner Coffman

ROBERT HALF
OF ST. LOUIS

7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

POSITION WANTED

SWISS PROGRAMMER, experience in COBOL, BASIC and ASSEMBLER, seeks job in U.S.A., write M. Hurler, Im Bindschadler 28, CH - 8703 Erlenbach, ZH.

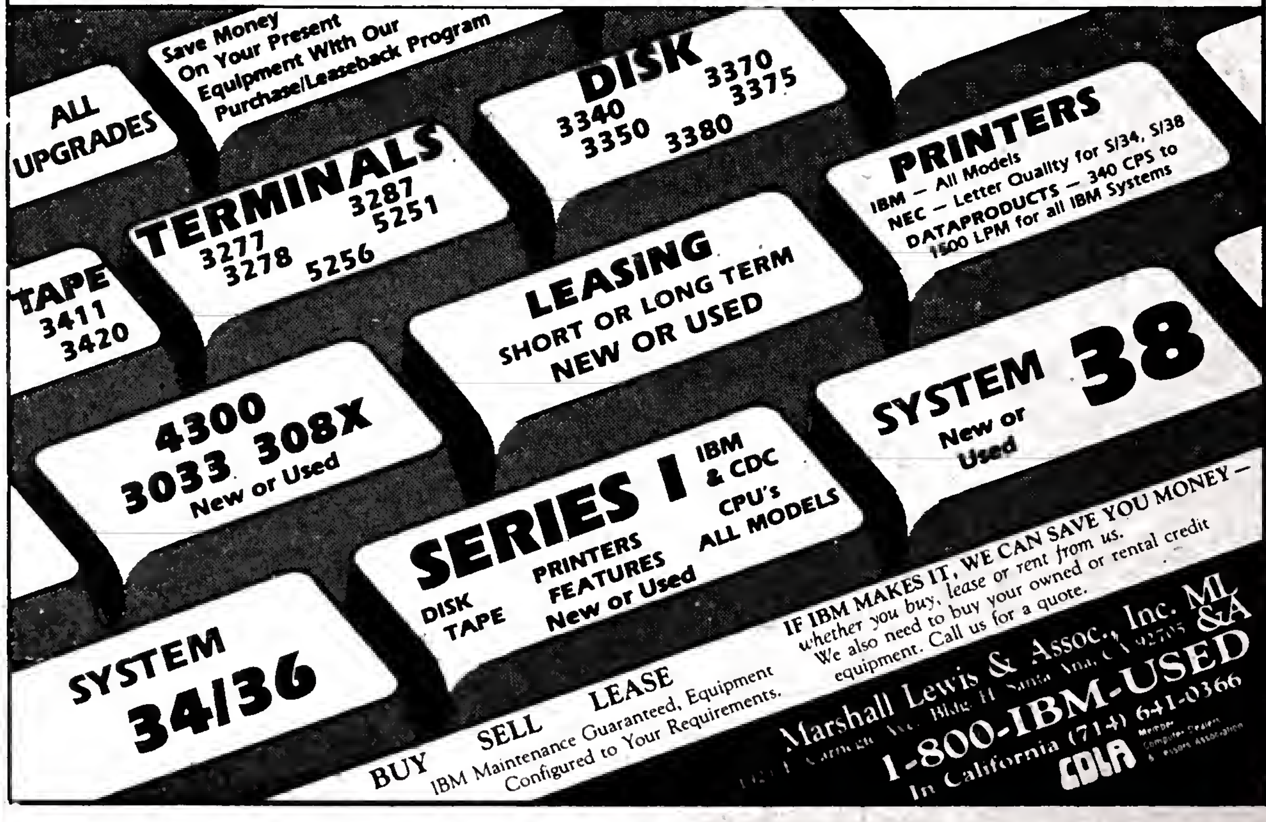
BUY - SELL - SWAP

SERIES I SPECIAL

Control Data
126MB Removable Drives . . $12,900
Diskette Drives . . . . $ 1,495
Printers & Displays

New or Used
Immediate Delivery

IBM
4956 Processors
4967 200MB Disk Drives
All Peripheral & Features


ALL UPGRADES
Save Money On Your Present Equipment With Our Purchase/Leaseback Program
DISK 3340 3350 3370 3375 3380
TERMINALS 3277 3278 3287 5251 5256
PRINTERS
IBM — All Models
NEC — Letter Quality for S/34, S/38
DATAPRODUCTS — 340 CPS to 1500 LPM for all IBM Systems
TAPE 3411 3420
LEASING SHORT OR LONG TERM NEW OR USED
4300 3033 308X New or Used
SYSTEM 38 New or Used
SERIES I IBM & CDC CPU's ALL MODELS
DISK TAPE PRINTERS FEATURES New or Used
SYSTEM 34/36
BUY SELL LEASE

IBM Maintenance Guaranteed, Equipment Configured to Your Requirements.

IF IBM MAKES IT, WE CAN SAVE YOU MONEY — *whether you buy, lease or rent from us.* We also need to buy your owned or rental credit equipment. Call us for a quote.

Marshall Lewis & Assoc., Inc. ML&A
1211 Carnegie Ave. Bldg H Santa Ana, CA 92705
1-800-IBM-USED
In California (714) 641-0366
CDLA Member Computer Dealers & Lessors Association

ceres announces

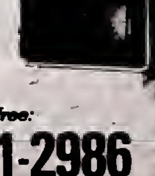
- *New 3370's Immediately Available*
- *System 36,4381 Operating Leases*
- *All Peripherals Immediately Available*
- *System 34 Upgrades, 72 hr. Notice*

NEW YORK — **(212) 279-4467**
HOUSTON — **(713) 627-7117**

asca MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

MEMBER AAEL AMERICAN ASSOCIATION OF EQUIPMENT LESSORS

WANG WORD PROCESSORS AT THOUSANDS OFF!



Guaranteed, remanufactured WPS 20, WPS 30 and Wangwriters available for *immediate delivery*. You don't pay a cent till Wang installs and places equipment under service contract. 15-day return privilege. Buy, Lease, Rent!

For Free info and fast answers call toll-free:

1-800-321-2986

ELECTRONIC OFFICE EXCHANGE, INC.
Dept. SC3CWD • Box 7337 • Ann Arbor, MI 48107

SYSTEM 34 ALL UPGRADES

Call Collect:
404-252-7480

S/1
S/38
Buy
Sell

DATAMARC
6065 Roswell Rd.
Suite 320
Atlanta, GA. 30328

IBM PARTS

Same day or overnight

SAVE Call Collect 404-252-7480 SAVE

HP

1000
SERIES E,F,M
12749 H Hi-Perf Mem
3000
SERIES II, III,
33, 64

7925 120 MB DISK DRIVE
7970E 1600 BPI
TAPE DRIVE
2631B 180 CPS PRINTER
2622A TERMINAL &
MUCH MORE
2601A PRINTER
2680A LASER PRINTER
7976A TAPE DRIVE

TELEX 756927
encore
(213) 452-9117

IBM

5110 5120
3741 3742
DATAMASTER

1255 MICR

SYSTEMS
34 36 38 32 23
All Associated Peripherals

BUY SELL LEASE

- Printers - Display Stations
- Upgrades & Feature Add-ons
- Trades Taken
- IBM Maintenance Guaranteed

Call Today for Quotation
(615) 352-6565

SOUTHERN
DATA SYSTEMS
Nashville, Tennessee

DSI

BURROUGHS

Discover the DSI alternative.

800-641-5215
All equipment available immediately and guaranteed for Burroughs Maintenance.

DSI Serving the Burroughs Community Worldwide
1440 So. Lipan, Denver, CO
80223 (303) 777-8211
Telex 756-102

COMDISCO®

A Commitment To Excellence

IBM PROCESSORS IBM PERIPHERALS

Immediate Availability

- ☐ 3081 Available Now New or Used
- ☐ 3083 Will Finance Your Delivery Position—Used Units Available Now
- ☐ 3033 Lease or Sale All Models - All Features
- ☐ 4341 Group 1's and 2's Lease or Sale
- ☐ 4341/4381 Overlap Leases Available
- ☐ 4381 Positions Available For Lease
- ☐ 4331-2/4361 Overlap Leases Available
- ☐ Amdahl V/7 and V/8 Machines Available For Lease

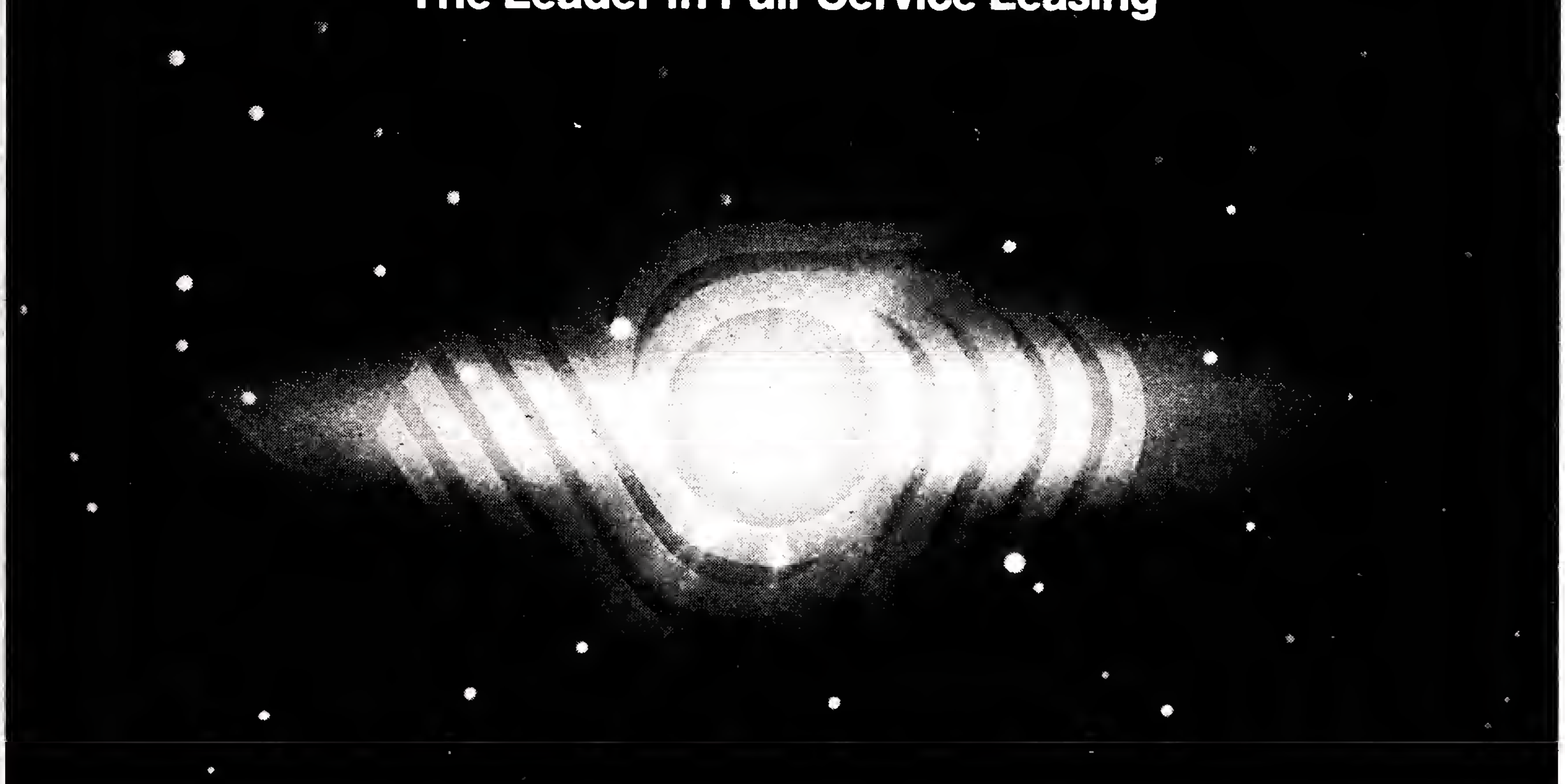
- ☐ 3350
- ☐ 3880-1/-2/-3
- ☐ 3380 AA4/B4
- ☐ 3370/3375
- ☐ 3803-2/ 3420-4/6/8
- ☐ 3705/3706 Interim Leases to 3725
- ☐ 3725 Leases Available For New Units
- ☐ 3178/3278
- ☐ 3890 Document Processors 30/60 Day Availability
- ☐ 3800/3211/3203 Printers Available

Call Your Comdisco Representative Today

Eastern Regional Headquarters	
(Connecticut)	**203/655-1211**
Fort Lee, NJ	201/592-4600
Washington, DC	301/441-1000
Philadelphia, PA	215/545-8035
Boston, MA	617/542-4005
Red Bank, NJ	201/842-5111
Federal Government Marketing Office	
(Washington, D.C.)	**301/441-1000**
Midwestern Regional Headquarters	
(Chicago)	**312/698-3000**
Michigan	313/644-1500
Western Regional Headquarters	
(San Francisco)	**415/944-1111**
Los Angeles	213/436-7757
South Central Regional Headquarters	
(Dallas)	**214/641-3255**
Houston, TX	713/445-1815
Atlanta, GA	404/256-5956
Florida	305/428-3177
Charlotte, NC	704/335-0804
Canadian Regional Headquarters	
(Toronto)	**416/968-7135**
International Headquarters	
(Chicago)	**312/698-3000**
Latin America	305/666-6258
London	44-6286-67123
Paris	01 524.5270
Switzerland	41 (21) 71.09.35
Dusseldorf	(2434) 5048
Stuttgart	0711-25-43-40
Speyer	062-32-36655

Corporate Headquarters
6400 Shafer Court 312/698-3000
Rosemont, IL 60018 TWX 910-253-1233

The Leader In Full-Service Leasing



A MEMBER OF CDLA AND LISTED ON THE NEW YORK STOCK EXCHANGE

3375's
A1, B1, B1, D1
Available 8/1-84
Sale/Lease

4341's
Lease Terms 1-5 Yrs.
4381's
Sale/Lease

Control Units
3880 - B13
3880 - D13
Avail. July 84
Sale/Lease

PRINTERS - 4245 • 3203 • 3800 • 3211 • 1403 • 3262 • 3289 • 3287 • 5256

Controllers
3880 3274
3803 3276
Display Stations
3278 3178
3279 3277

DASD
3380 3375
3370 3350
3344 3310
Immediate Delivery

TAPE DRIVES
3420 3430
3410 8809
Immediate Delivery

We Buy, Sell & Lease IBM Processors and Peripheral Equipment

Computer Marketing Inc.
9710 VENTNOR AVENUE
MARGATE, NJ 08402-2223
609/823-6000 • 800/345-0005
Contact/Bernie Gest

CDLA

Will BUY...SELL...LEASE...

Systems 34/36/38/4300

- Financial Advantage Is Yours Through CPU
- New Or Previous-Owner Processors Available
- Immediate Delivery
- IBM Maintenance
- Create Cash Flow With CPU Purchase/Lease-Back

Call 503/222-2226 Collect

CPU Sales & Leasing, Inc.
3477 Northwest Yeon • Portland, Oregon 97210

CPU

MEMBER
AMERICAN SOCIETY OF COMPUTER DEALERS
ascd

Will the real lessor please stand up!

Who do you want to deal with during your computer lease?

An investor? **An insurance company?** **A consortium of banks?** **Or your leasing company!**

As computer experts, we understand your individual equipment requirements. Hartford Computer Group doesn't sell your leased equipment to an investor who will not understand or care about your requirements.

When you sign a lease with Hartford Computer Group, you deal only with us. We maintain complete ownership and control of your leased equipment and can therefore give you the *flexibility* you want in a computer lease. We can do this only by refusing to participate in tax-advantaged leasebacks that give investors control over your leased equipment. Tax-advantaged leases allow for little or no flexibility!

We give you Hartford Computer Group. Want to lease computer equipment? Want to upgrade your computer equipment, renew your lease, or change your leased system completely? With no outside investors or participants to inhibit your transaction, Hartford Computer Group is free to offer the ultimate flexibility in customer service.

You deal with one company, before and after the lease begins, the real lessor... Hartford Computer Group!

Your questions about our unique computer leasing program are answered in our brochure. Write or call for your copy.

Hartford Computer Group **800 323 6355**

A Subsidiary of Hartford Financial Corporation
515 East Golf Road, Arlington Heights, IL 60005

or 312 364 0505

DEC®

Digital Dealers Association

RENT • BUY • UPGRADE • SELL

PDP, 11/03, 11/04, 11/23, 11/24, 11/34, 11/44, 11/70, VAX/730, VAX/750, VAX/780

SYSTEMS • OPTIONS • SUPPLIES

11/24	1MB, Dual RLO2, DZ11-A, Cabinet	IN STOCK
11/23 +	256KB, Dual RLO2, DZV11-C, VT102, license	$15,950
11/70	MOS & Core Configurations available	starting at $29,500
VAX 750	1MB, RUA81, TU80, DMF32, VMS	SPECIAL
VAX 780	2MB, 2RMO5, DZ11's, TEE16, 600LPM Printer	$6,500/mo

Customized Configurations—Call With Your Request.

In Stock

11/24-BC
11/34A-YE
BA11-FD
DH11-AD
DMF32
DMR11-M
DZ11-E
DZ-32AP
FP11-A
KDF11-AA

Specials

RUA81-AA (NEW)	**$20,400**
MS750-CA (NEW)	**$ 2,850**
RP06-AA	**$11,850**
LP11-VA	**$ 2,495**

In Stock

KT24
LA120-DA
MK11-CE
MS11-PB
MS750-DC
RH780
RKO6-EA
RLO2-AK
RMO3-AA
TS11-CA

CALL FOR OUR FREE CATALOG

DEC is the registered trademark for Digital Equipment Corp.

BROOKVALE ASSOCIATES
265 Oser Avenue, Hauppauge, New York 11788
800-645-1167 (NY) 516-273-7777

IBM UNIT RECORD EQUIPMENT

DISK PACKS—DATA MODULES—MAG.TAPE—DISKETTES

SALE OR LEASE

IBM UNIT RECORD MACHINES

026—029—082—083—084
085—087—088—129—514
519—548—557

NEW & USED
DISK PACKS—DATA MODULES
2316—3336(1)—3336(11)—3348(70)
MAG. TAPE-DISKETTES
Every Item Guaranteed

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION
5633 W. Howard St. Chicago, IL 60648
800-621-3906 (IL-312-647-0880)

WANT TO BUY

SYSTEM/34 PERIPHERALS

5251's, 5291's, 5224's, 5225's, and 5256's

Call 214/258-0541

MCC
Metroplex Computer Company, Inc.
320 Decker Drive • Suite 180 • Irving TX 75062 • TLX 75-9774

BUY

SERIES/1
Immediate
CASH
For Your
Series/1

Call toll-free **800-328-5718**
(in Minnesota, 612-544-8660)

COI
COMPUTER OPTIONS INC
"the best option"
1660 South Highway 100
Minneapolis MN 55416

AVAILABLE IMMEDIATELY FOR SALE OR LEASE!

DEC VAX 11/750
3 Meg of Memory, 1 TU 80 Tape Drive, 1 RA81 Disk Drive, 1 600 Lpm Band Printer, 6 Display Units

Contact: BOB LUTZ
(203) 573-5330
P.O. BOX 2126
WATERBURY, CT 06720

STC

TAPE/DISK

BUY • SELL • LEASE

DOUBLE DENSITY DISK
3420 TAPE SYSTEMS

CALL PAM CHRISTIANSEN
(408) 241-3677
Marketex Computer Corporation

Want to Buy

5291, 5251, 5256
IBM Planar Boards
$100 each
For Details Call
(915) 692-9141
Russell Sullivan

Computech

DATA GENERAL

End User Needs To Sell

2-6097A 1.26MB Quad Floppy
2-6099A 12.5MB Winchester
2-6074 LP2 Printers

On Maintenance Until Deinstallation
Shipping Included
Total Package $6,000
Contact Greg Smith
(217) 789-7539

Computerworld CLASSIFIEDS:
Our business is to help you improve ***yours***— via programmers, analysts, engineers, terminals, printers, software packages, computer time, computer services, office space, advertising for seminars & conferences, business opportunities, etc... ***AND ... ...exposure to an audience of over half a million readers nationwide... ...every week.***

SYSTEMS
4341 4331
38 36 34
32 3
BUY • SELL • LEASE
COMPUTER BROKERS, INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE
CB
TOLL-FREE
800-238-6405
901-372-2622
PERIPHERALS
3203 3370
327X 3411
3350 3420
asCd MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

IBM
SYSTEM/34
S/3 • S/32 • S/38
5291 • 5251
3741 • 3742
BUY • SELL • LEASE
REFURBISHED • RECONFIGURATED
SHORT-TERM LEASES
PURCHASE/LEASEBACK
Tennecom
MARKETING INCORPORATED
210 SPACE PARK NORTH
P.O. BOX 248
GOODLETTSVILLE (NASHVILLE)
TENNESSEE 37072
800-422-1004
IN TENNESSEE CALL: (615) 859-3872

TEN REASONS WHY FORTUNE 500 COMPANIES LEASE FROM RANDOLPH.

1 FINANCIAL STABILITY. As an important part of the Bank of Boston, one of the nation's oldest and leading financial institutions, Randolph has a built-in financial stability that continues to be unique in the third-party computer leasing industry.

2 19 YEARS IN THE BUSINESS. Randolph has been serving Fortune 500 companies since 1965 . . . a history that gives added assurance that we'll continue as a leader in the industry.

3 HIGH-TECH LEASING IS OUR ONLY BUSINESS. Leasing computers is a lot different than leasing boxcars. Computer technology changes almost daily and with it the value of the equipment. Randolph not only keeps current on the state of the art but has learned to anticipate important changes.

4 ACTIVE REMARKETING DIVISION. Our unique customer support assures maximum return on investments in computer equipment which is no longer in use.

5 UNIQUE SERVICE. In addition to the manufacturer's service Randolph has a technical staff that is on call to help reconfigure systems to meet the changing requirements of large companies.

6 COAST-TO-COAST RANDOLPH. Even though large companies may have computer sites all over the country Randolph is right there to serve them. We presently have customers in over 300 cities and towns from Maine to Hawaii.

7 WE SPECIALIZE IN SOLVING PROBLEMS. Large companies can have a variety of problems . . . like machines installed on a rental basis, being stuck with a lease on an old machine or long waits for delivery. Whatever the problem, we can tailor a lease that will fit the need.

8 WE ARE DP PROFESSIONALS. At Randolph, our people have an average of 18 years in the DP industry . . . from 360's to 3084's. They know all about alternative financing to be sure, but they also know their way around a DP department and the hardware in it.

9 WE GO BEYOND COMPUTERS. Randolph has been dealing with peripherals from the very beginning. Now we're involved in leasing communications systems and office automation equipment because that's what Fortune 500 companies demand.

10 WE SAVE THEM MONEY . . . LOTS OF MONEY. Randolph has been saving its customers 30% to 70% of their DP hardware dollars. Fortune 500 companies know leasing is still the most financially attractive method of acquiring computer equipment at low cost without draining working capital.

HOW ABOUT YOU? What we've done for so many of the Fortune 500 companies we can do for you. Call Joseph B. Kelly, Jr., Executive Vice President, **800-243-5307.**

537 Steamboat Road
Greenwich, Connecticut 06830
203-661-4200 • 800-243-5307

Randolph

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION **RANDOLPH COMPUTER CORPORATION** *A subsidiary of* THE FIRST NATIONAL BANK OF BOSTON **BANK OF BOSTON**

DATA GENERAL
We Buy, Sell And Service
New And Surplus Systems and Peripherals
Call Or Write
Hanson Data Systems
(outside Mass. toll free) 1-800-225-9216
(within Mass.) (617) 481-3901
P. O. Box 27, Southboro, MA 01772

FORSYTHE McARTHUR ASSOCIATES, INC.
DEALER / LESSOR OF IBM
Computers and Peripherals
FOUNDED 1971

Home Office
Skokie
7500 Frontage Road
Skokie, Illinois 60077
312 675-8000

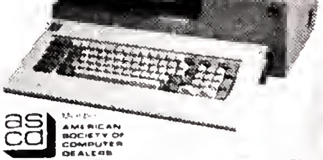
Branch Offices
Atlanta 404 953-9457
Detroit 313 540-0909
Milwaukee 414 785-9544

CDLA

ATTENTION TO DETAIL
ALL OF OUR IBM EQUIPMENT IS: Tested/Audited/Refurbished
SERIES 1 *New/Used IBM and CDC*
SYSTEM 34 *Immediate Upgrades;*
SYSTEM 38 *All Related Peripherals;*
SYSTEM 36 *Trade In Your System 34 Operating Leases;*
4300 *Tape, Disk, Most I/O in Stock;*
5110 *S/23's and 5120's in Stock;*
P.O.S. *5265's a Specialty, Upgrades/Downgrades, Short Term Leases;*
3600/4700 *Banking*
XERXES COMPUTER SALES
1614 Harmon Place
Minneapolis, MN 55403
800/328-3884, 612/339-3042

You can get information on buying or leasing
IBM 34-36-38
as fast as you can dial
1/800/LEAS-PAK.
In Texas call 817/268-0023.
Up to 50% Savings
LPI
LEAS PAK INTERNATIONAL
P.O. Box 759 • Hurst, TX 76053 • 817/268-0023
Send for our free products and services brochure:
Name ____________
Address ____________
City ________ State ________ Zip ______
Phone ____________

Limited System 36 deliveries, new displays and printers in stock. We want to buy your owned or rental credit equipment.



asCd Member AMERICAN SOCIETY OF COMPUTER DEALERS

Complete inventory of used equipment...

SYSTEM 34
all models and all upgrades to S/34

SYSTEM 38
Model 4-5 & 7
■ All Peripherals

IBM® AT A SAVINGS!

SYSTEM 36
■ 30 day deliveries
■ Operating lease plans
■ Trade-ins on S/34

Contact Datacomp and find out how much you can save...

Call Toll Free
800/323-3289

datacomp leasing & service group

Lease Plans
■ Significantly better rates and more flexible than IBM
■ "FASB" qualified 2 & 3 year operating plan

Compare Before You Lease!

	Datacomp	IBM Credit Corp.
Lower Rentals	YES	NO
Operating Lease Qualified	YES	NO
Flexibility: All Upgrading	YES	NO
Replace Equipment	YES	NO
Early Termination	YES	NO

Chicago **312/323-1200**
New York **201/467-8686**
Los Angeles **714/671-3911**

■ 3 A-1 Dun & Bradstreet rating ■ 2500 Satisfied Customers ■ IBM Knowledgeable Professionals ■ Satisfaction Guaranteed

CDLA

NPA

"Log on with NPA, we cover your DG computer needs from Coast to Coast"

SYSTEMS INC.

SPECIALIZING IN:

PURCHASE, SALE, TRADE, LEASE, RENT

AND SERVICE OF

Data General

EQUIPMENT

Millions of dollars in DG equipment ready for overnight shipment from either coast.

FOR IMMEDIATE INFORMATION CALL:

NEW YORK	CALIFORNIA
516-467-2500	**415-930-8353**

TELEX #510 222-0880

OR WRITE: NPA
761 COATES AVENUE • HOLBROOK, N.Y 11741
or
47 QUAIL COURT • SUITE 201 • WALNUT CREEK, CA 94596

PLEASE PLACE ME ON YOUR MAILING LIST AND KEEP ME INFORMED OF NPA SPECIALS
RETURN THIS FORM AND RECEIVE UP TO $200.00 OFF OF YOUR NEXT PURCHASE

NAME
TITLE
COMPANY
ADDRESS
CITY
STATE ZIP
TEL

NPA

NEW LEASE PROGRAM

IBM 4381

2 Or 3 Year Term Low Monthly Rent
Customized Flexibility
Your Delivery Position Or Ours

Forsythe/McArthur Associates
Hdqtrs: **Skokie, IL (312) 675-8000**
Atlanta (404) 953-9457 Milwaukee (414) 785-9544
Detroit (313) 540-0909

The nationwide market – a call away!

DEC/DG

SYSTEMS/PARTS/PERIPHERALS
NEW/USED/SURPLUS • DISCOUNT PRICES

Since 1977! Buy, Sell, Trade and Broker.

PHIL	**BRYAN**	**JENNIFER**
DG	11-VAX	8-LSI

CALL TODAY - (305) 392-2005

TELEX 568-670

thomas business systems, inc.
4301 Oak Circle - Unit 11 Boca Raton, Florida 33431

CONVERGENT TECHNOLOGY EQUIPMENT

New and Used
Available For Sale
Contact Gary Crow
(215) 293-2952

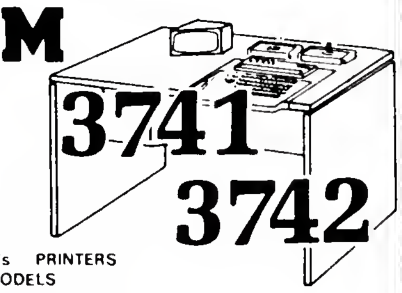
BURROUGHS B92 BETA SYSTEM

Includes B92 2 MHZ Processor Console, 192 KB Main Memory, 120 CPS Matrix Printer, Out of Paper Detect, Operator Display Station and Control, 1 MB Inbuilt Mini Disk Drive and Control, 18.8 MB Fixed Disk Drive and Control and a Diablo 630L Letter Quality Printer and Controls. Price Negotiable. Timothy J. Gay, CPA, PC, 3710 N. 7th Street, Phoenix, AZ 85014, (602) 266-8294.

Buy - Sell - Lease

S/34
S/36
S/38

IBM



3741
3742

CPU's CRT's PRINTERS
ALL MODELS
PURCHASE/LEASEBACK
SHORT & LONG TERM LEASES

CMA

Computer Marketing of America, Inc.
P.O. Box 71
610 Bryan Street
Old Hickory, Tennessee 37138

ascd MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

1-800-251-2670

In Tennessee: 615-847-4031

DEC

NATIONAL COMPUTER EXCHANGE

BUY • SELL • LEASE
Systems, Options, Modules

800-624-9299

600 N. Lunar, Brea CA 92621
In Calif. (714) 990-5988
TWX 910 596-1499

SELLING?

More than half a million active computer people read COMPUTERWORLD each week. That means:

- **YOU can reach them efficiently in COMPUTERWORLD Classifieds.**
- **YOU can find buyers for discs and DEC's, terminals and timesharing, software, System 370's, and more.**
- **YOU can join the THOUSANDS OF ADVERTISERS who use our classifieds because they get RESULTS.**

To place your ad, or to get a rate card with complete details on COMPUTERWORLD Classifieds, call or write:

Classified Advertising
COMPUTERWORLD
P.O. Box 880
Framingham, MA 01701

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET

Absecon, NJ (609) 645-7282
Boston, MA (617) 367-5755
Chicago, IL (312) 693-2790
Dallas, TX (214) 385-0806
Encino, CA (818) 789-0113
Houston, TX (713) 780-7459
Lebanon, TN (615) 449-6633
Miami, FL (305) 442-2968
Newport Beach, CA (714) 752-8443
Tampa, FL (813) 273-8028
Frankfurt, Germany Telex: 414561 LCO D
Montreal, Quebec (514) 871-1121
Nyon, Switzerland Telex: 27209 CMI CH
Paris, France Telex: 613910 CMI FR
Toronto, Ontario (416) 842-3085
(416) 362-5400
Vancouver, B.C. (604) 685-6196
Windsor, Ontario (519) 973-3910

CMI FINANCIAL SERVICES GROUP
2600 Telegraph Rd., P.O. Box 2026
Bloomfield Hills, MI 48303-2026
(313) 456-0000

CMI

A Torchmark Company
2600 Telegraph Rd., P.O. Box 2026
Bloomfield Hills, MI 48303-2026
TWX/TELEX: 810-232-1667 CMI CORP. TRMI
(313) 456-0000

3081-D16
Sale or Lease

3081-K24
Sale or Lease

For Sale/Lease
4381
1st Quarter Delivery

3033
All Models

New
Series 1
with
Serix Operating System
"Unix" ™ on the Series 1
IBM Master VAR
TM Trademark of Bell Laboratories

3370'S
Available Now
3350, 3375, 3380
For Sale or Lease

3890-A6
Available Now
4700
Banking Equipment
Buy/Sell/Lease

3725
Lease Financing Available
For your System or Ours
2,3,4 or 5 Year Terms

3800
LASER PRINTERS
Model 1's Immediate Delivery
Model 3's Lease Financing
Available-Any Term
3203-5 3211-1 & 3811-1
3262-5 4245-1

Tapes
Immediate Delivery
3803-3420
Buy/Sell/Lease

For Sale/Lease
4341-1
4341-2
Call Now

3278, 3279
3277, 3276
Terminals
All Models
Immediate Availability

3705-3704
Available for
Immediate Delivery
Sale or Lease

SYSTEM 38
Model 7 & 5 Available Now
New - Used
SYSTEM 36
2, 3, 4 or 5 Year Terms
Lower rates than ICC
8130's
Available Now - Sale or Lease

Series 1 I/0
All IBM Peripherals
Any Used Configuration
CDC Fixed/Removable Disks
Tape Back-up $4995.00
CDC/Datasouth/Printronics
NEC/Printers
Buy/Sell/Lease

SERIES 1
4978 CRT'S
FEATURES — PERIPHERALS

LARGE USER HAS COMMISSIONED NATIONAL COMPUTER EXCHANGE TO SELL MULTI-MILLION DOLLAR INVENTORY OF IBM SERIES 1 EQUIPMENT. HUNDREDS OF CPU'S, FEATURES, ATTACHMENTS AND CRT'S. WILL CONFIGURE TO YOUR NEEDS. EQUIPMENT REFURBISHED AND GUARANTEED ELIGIBLE.

CALL THE SERIES 1
HOT LINE
800-624-9299

NATIONAL COMPUTER EXCHANGE

600 North Lunar Avenue • Brea, CA 92621
(IN CALIF.) 714-990-5988 TWX: 910-596-1499

IBM
SERIES/1
S/34 • S/36 • S/38 • 4300
5110-5120 • S/32
BUY • SELL • LEASE
All models, systems
& peripherals
AVAILABLE NOW!
Ask about our
72 hour
upgrades.

(408) 425-7333

SOURCE
DATA PRODUCTS, INC
1114 Water St., Santa Cruz, CA 95062

IBM
3270
PRINTERS, TERMINALS
& CONTROLLERS
Please Call: 312 675-8000
Forsythe/McArthur Associates, Inc.
7500 Frontage Road
Skokie, Illinois 60077

Why Worry?

Let DANA Do Your Sweating!

For All Your IBM® Buy/Sell/Leasing Needs

DPD			GSD		
CPU	DISK	TAPE	CPU	PRINTER	TERMINAL
4341	3380	3420	S/34	5211	5251
4331	3375	3803	S/36	3262	5291
3081	3370		S/38	5224	
3083	3350			5225	

Authorized dealer for GBT® and Decision Data® Products
Printers and CRT's plug compatible to S/34. S/36. S/38

DANA MARKETING, INC.

800 433-4148
In California call 213 372-8845
Connecticut office 203 359-8040

PLUS • PLUS • PLUS • PLUS • PLUS • PLUS

FOR DEC
CALL SCHERERS
11/23-BE 11/23+ 512 KB
BRAND NEW 40% OFF $3,995.
(614)889-0810

PLUS • PLUS • PLUS • PLUS • PLUS • PLUS

DEPOT REPAIR
IBM 5251, 5291
CRT Assembly and
Planer Boards
For Details Call:
(915) 692-9141
Russell Sullivan

Computech

LEASE • PURCHASE • SELL

IBM SYSTEMS

- *Purchase-Lease Back*
- *Customized Leasing*
- *Upgrade Flexibility*
- *All models and peripherals*

612-941-0510

WINTHROP
FINANCIAL CORPORATION
computer sales & leasing division

6400 Flying Cloud Drive • Eden Prairie, Minnesota 55344 • 612/941-0510

We're serious about

SERIES1

We buy, sell and lease new and used equipment. Call Lynn Ellis for a Dataserv QUIKQUOTE™ on 4978's and other models.

(800)328-6729

dataserv

When you decide why and what to buy,
let us show you how!

FRONTIER
COMPUTER CORPORATION

Your Full Service
Computer Dealer

DPD
MAIN FRAMES
PERIPHERALS
COMMUNICATIONS
— *Call* —
FRED HANSEN

S/34
S/36
S/38
& RELATED PERIPHERALS
— *Call* —
RICHARD LORANG

Series/1
- Systems Configured To Your Specs
- All Features and Peripherals Available
- Depot Repair Service

— *Call* —
JOHN BURLEW
RANDY STONE

3270's
3277 • 3278
3274 • 3276
3271 • 3272
— *Call* —
TERRY SMITH

DALLAS: 214 - 330-7243 • HOUSTON: 713 - 550-7356
OUTSIDE TEXAS TOLL FREE 800 - 527-6438
CDLA
4573 South Westmoreland
Dallas, Texas 75237
•
16151 Cairnway, Suite 103
Houston, Texas 77084
ascd MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

EX GERMANY FOR SALE

IBM 3081 - G24/G32 With 1550
IBM 3082 - 024 With XF4300
IBM 3087 - 001
IBM 3089 - 001
IBM 3278 - A02
IBM 3279 - A02
Delivery: August/September 1984 - FOB Munich

This is a very rare opportunity,
the equipment is our full property and not a tax deal.
Also for Immediate Delivery
FOB Warehouse Frankfurt/Germany (All 604Z)
3125-H00, 3504-A01, 3203-002, 3340-A02/B02
Please make offer.
For further information please contact Mr. Sefler or Mrs. Wiegand,
Tel. 0611/690-4610 or 690-4655.
ACL-ABACUS COMPUTER LEASING GMBH
Airport, Building 131
D-6000 Frankfurt/Main 75 (West-Germany)
TLX.: 413799 Abacu D

FOR SALE
3033
MEMORY
IBM & INTEL
U8-U16
Available Now
Ron Breckner
Data Sales Co.
(612) 890-8838

Check us out for DEC

11X44 $23,000 ☐ RL02-AK $2,300 ☐ 11/23 Any Config.
VAX 750 $43,000 ☐ VAX 780 $131,000
All immediate and guaranteed, Everything from 11/23 to VAX

DATAWARE SYSTEMS LEASE
800-221-6318 30 Bay St · S.I. N.Y. 10301 (212) 447-4911
TELEX 429394/TWX 710588-6738

BRAND NEW AND FACTORY REFURBISHED

WANG MATRIX PRINTERS
CHEAP!

2231, 2221, 5521 with/without interface at tremendous discounts and fast delivery. Limited quantity; call today to reserve yours.

1-800-321-2986
ELECTRONIC OFFICE EXCHANGE, INC.
THE PRE-OWNED WANG EQUIPMENT PEOPLE™

VAX 11/780
Brand New
220V/50Hz
11/780XA-AJ, FP780-AB
DMF32-LP, H7112-B
TU80-AB, RUA80-AB
LA100-CB, QE001-HH (v3.5)
Fully Integrated
Available for Immediate Shipment
Conversion to 60Hz Available for $11,000
Contact Mr. David Bond, (617) 491-2700
Cambridge Digital Systems
P.O. Box 568
65 Bent Street
Cambridge, MA 02139
Telex: 92-1401 COMPUMART CAM

BUY ...... SELL
SWAP

Well-Equipped To Serve You In Buying or Selling:

HARDWARE
SOFTWARE
COMPUTER TIME & SERVICES

Over 500,000 computer people read **COMPUTERWORLD** every week. So, placing an advertisement with us is going to help you take care of your computer-related business...very quickly.

Deal us in on your business needs.

Call the Classified Department at 1-800-343-6474 or (in Massachusetts) (617) 879-0700 to place your ad.

TexCom

WE BUY • SELL • LEASE

JOIN THE MANY FORTUNE 500 COMPANIES THAT UTILIZE IBM EQUIPMENT FROM TEXCOM. . . THE IBM SPECIALISTS

SERIES I

- All features and peripherals
- We buy, sell or trade
- Convenient leases available

4331/4341 • 4361/4381

- We buy, sell or lease
- Two, three, four year leases

WE'VE GOT IBM PERIPHERALS

3803	3380	3350	3211
3420	3880	3370	3811
3375	3340	3203	3262

IBM S/34 — 36 — 38

- All upgrades available now
- One, two, three year leases
- We'll take S/34 trade-ins.
- All models and peripherals

**WE'VE GOT ALL IBM PRINTERS
AND TERMINALS
PLUS 3864 MODEMS NOW.**

FOR SALE OR LEASE

IBM PC-XT'S
256K, COLOR MONITOR
AND GRAPHICS PRINTER.

Call Toll Free: 1-800-833-9119

SAN ANTONIO (512) 349-9955
MEMPHIS (901) 756-7055
HOUSTON (713) 890-8714

SAVE UP TO 60%

SERIES 1

CPU'S • PERIPHERALS • ALL MODELS

SYSTEM 34•36•38

TOP SAVINGS • QUICK DELIVERY • SHORT AND LONG TERM LEASES • MEMORY • FEATURES • UPGRADES

4331·4341·4361·4381

UPGRADES • FEATURES • LOW LEASE RATES

3083 • 3081

EXCELLENT LEASES AVAILABLE
TWO TO FIVE YEAR TERMS

CALL TOLL FREE **800/328·5718**
IN MINNESOTA 612/544 • 8660

COMPUTER OPTIONS, INC.
1660 SOUTH HIGHWAY 100 • MINNEAPOLIS, MN 55416
"Your best option"

4381 AVAILABLE FOR SHORT-TERM LEASE

- **SAVE 20% ON IBM RATE.**
- **NO MAINTENANCE COSTS.**
- **IBM SHIPS NEW ON AUGUST 31st.**
- **9-MONTH TERM.**
- **MODEL L1 WITH 3279-2C CONSOLE**

Call John Abbott **(800) 243-5307** (203) 661-4200 (In Conn.)

Randolph

Randolph Computer Corporation
Division of Bank of Boston • 537 Steamboat Road, Greenwich, CT 06830

Specialists In The Buying, Selling And Leasing Of Word Processors

IBM Displaywriters

Immed. Delivery
We Purchase All Displaywriters

CDB FINANCIAL, INC.

8035 East R. L. Thornton Freeway Suite 302
DALLAS, TEXAS 75228
(214) 324-3491

C.D. SMITH & ASSOCIATES, INC.

DEC computer systems & options
12605 East Freeway, Suite 318
Houston, Texas 77015
(713) 451-3112
TELEX 76-2547

DEC

WE ARE SELLING:
VAX 11/730, 11/750, 11/780
& MOST VAX OPTIONS

ALSO:

RA81-AA	$17,000	RMO2-AA	$8,500
MS750-DC	8,500	DMC11-AR	1,000
MS750-CA	3,500	BCO6S-25	300
MS780-DC	3,500	TM78-C	4,800
DW780-AA	9,500	TU80-AA	9,500
DZ11-E	2,600	TSVO5-BA (New)	7,500
MS780-FD	3,500	11X44-FA	Call
RUA81-CA	24,000	11750-FA	Call
11780-KA	Call	MS780-EC	26,675

If you want on our Mailing List, call Valerie (713) 451-3112.

Inflation Fighters

Quality & Savings

Slightly used. Money Back Guarantee. Full Reels. All External Labels Removed Guaranteed for use at 800 BPI through 6250 BPI.

2400' Reel	$4.95 ea.
1200' Reel	$4.25 ea.
600' Reel	$3.50 ea.

All Tapes with Hanging Seals

We pay freight on orders over 200 tapes.
All orders shipped within 48 hours.
Call or Write

Computer Tape Mart
44A Seabro Avenue
N. Amityville, New York 11701
[516] 842-8512

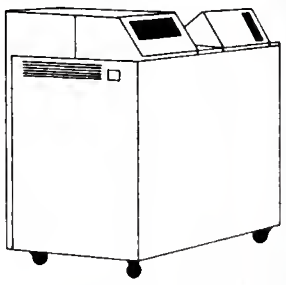
MARION

BUY • SELL • MAINTAIN

IBM SYSTEM/34/36

DISPLAY STATIONS

- PROMPT DELIVERY
- ALL SYSTEMS 34 ARE FULLY RECONDITIONED
- ALL SYSTEMS 34/36 CONFIGURED TO YOUR NEEDS
- PERIPHERALS — NEW AND USED
- UPGRADES AND FEATURES DELIVERED AND INSTALLED
- LONG TERM LEASES AT COMPETITIVE PRICES
- SHORT TERM RENTALS
- TRADE-INS ACCEPTED
- GUARANTEED WMC or IBM MAINTENANCE



SYSTEM 36

A PHONE CALL CAN SOLVE ALL YOUR EQUIPMENT PROBLEMS

TALK TO US . . .
NEW JERSEY (201) 343-4554
CONNECTICUT (203) 758-2409
PITTSBURGH (412) 864-6612

WILLIAM MARION CO., INC.
84 KENNEDY STREET, HACKENSACK, N.J. 07601

DIGITAL'S TRADING! RA81: $12,000*/TU78: $38,000*

Why settle for yesterday's storage technology when you can have today's ...affordably! Take advantage of Digital's TRADE-UP Program. Trade in your RM05 toward an RA81 fixed disk drive, or your TU77 toward a TU78 mag tape drive.

The RA81 offers 456 megabytes per drive...at the best cost per megabyte you'll find. And you can install up to three drives in one cab...no change in footprint.

With its 140 megabyte reel, the TU78 is a perfect companion to the RA81 for high-speed volume back-up. And at 6250 bpi recording density, its 2400-foot tape holds as much data as four TU77 tapes.

Interested?

Try a trade. Benefit three ways: lower cost of ownership, higher performance, and greater reliability. For the details, call Digital's Add-on Consulting Center, 800-343-4040, ext. 697 (in New Hampshire, 884-7990, ext. 697).

*With your Digital-maintained RM05-AA or TU77-FB in trade. Pricing and trade-in credit subject to change without written notice.

digital™

© Digital Equipment Corporation 1984

PICK A CARD . . .
ANY CARD
and call
800
828-4227
(703) 642-1950 Va. Res.
we're ready
to deal.

CARLYN
COMPUTER SYSTEMS
5105Q BACKLICK ROAD, ANNANDALE, VA 22003

IBM
BUY · SELL · LEASE

SERIES-1
S/34 • S/36 • S/38
4300
S/23 S/32 5110-20
Tape•Disk•Printers•Tubes

AMCOM
CORPORATION
5200 W 73RD ST · MINNEAPOLIS, MN 55435
(612) 835-4737
CALL TOLL FREE
800-328-7723

You Can Have Your 3725 In 60 Days.

You don't have to wait up to twelve months for delivery from IBM. We can lease you a new 3725 quickly, with the flexible terms and professional support our customers expect.

Lease your network hardware from the company that understands communications.

Centron DPL Company
7480 West 78th Street, Minneapolis, Minnesota 55435
Call Toll-Free 1-800-532-7532
In Minnesota Call (612) 944-9161
In the Southeast Call (305) 657-0077

Talk with us about your other IBM hardware needs.

FOR SALE NEW
UDS Desktop
Modems

201C 2400BPS....................$685 Each
208A/B 4800BPS..............$1610 Each

INSTOCK NOW
QTY DISCOUNTS AVAILABLE

Call or Write Clark Buch
Cass Marketing Services
14515 Hamlin Street
Van Nuys, CA 91411
(818) 994-9400 In Calif.
or (800) 423-2662

S/34 Upgrades Avail Also

VAX SYSTEM
TOTALLY INTEGRATED
80 Characters Per Second
Letter Quality Parallel Printer
$1,600
6250 Tri-Density Drive.
With Formatter And Cabinet
$25,000

MANDERS
BUSINESS SOLUTIONS INC.
5580 Havana, Suite 5A
Denver, CO 80239
303-373-4320

DCR
WHEN YOU'RE READY . . .
TO BUY• SELL• TRADE• LEASE
VAX-UBUS-QBUS
DEC TERMINALS
DIGITAL COMPUTER RESALE
713/445-0082
600 KENRICK • C-22
HOUSTON, TX 77076

FOR SALE
4341 - M2 - 8M6
3278 - A2
Available - 7/24/84
Contact: DAN AMYX
(714) 999-5141
CITY OF ANAHEIM
290 S. Anaheim
Anaheim, CA. 92805

BUSINESS OPPORTUNITY

SERIES 1
BUY SELL LEASE
Computer Brokers Inc.
Call Richard Crenshaw
Toll Free
800-238-6405
Also 901-372-2622

$100,000/YR. POTENTIAL
Are You Interested
In Starting Your Own
Computer Business?

National Marketing Program Includes:
- Continuous Training
- On-Going Technical Support
- National Advertising Program
- Largest Availability of Name Brand Products Anywhere
- No Store or Inventory Required
- Full or Part Time

No computer experience necessary, $12,500 investment.

Call MIS Systems Group
(213) 395-8661

Computerworld is covering the National Computer Conference in three issues:

NCC PREVIEW ISSUE
July 2, 1984
(Classified closing June 22, 1984)

NCC SHOW ISSUE
July 9, 1984
(Classified closing June 28, 1984)

NCC WRAP-UP ISSUE
July 16, 1984
(Classified closing July 6, 1984)

Have we got a tip for you! Do you need high quality job applicants or need to find buyers for your computer equipment? Our coverage of the National Computer Conference could be the answer to your problems. Again this year we have bonus distribution of Computerworld at the show. That bonus distribution means that over 500,000 readers will see your ad. Computerworld is offering you the chance to reach who you need to, along with giving you the insight to the happenings, speeches, and current news of the show. Information you should know!

Don't miss the opportunity of a lifetime.

For more information call or write:

COMPUTERWORLD
Classified Advertising
375 Cochituate Rd, Box 880
Framingham, MA 01701
800-343-6474
(617)-879-0700

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

DATA GENERAL

Desktop Generation
10, 20, 30 Immediate Delivery
Systems, Software, Service
Copley Management
(617) 769-9430

NEW DG CRT's
D-210....... $795 D-410........$1295
D-211....... $945 D-460........$1395
Desktops: Call for our special offer
Prices Include Spreadsheet Program
Any & All DG Cables In Stock
We Will Not Be Undersold On
Any New or Used DG Equipment
Kenco Data Systems, Inc.
(212) 687-2360

HONEYWELL

HONEYWELL DPS6/48
512K CPU; 80 MB Disk (67 + 13)
1-300 LPM Printer
1600 BPI Tape & Controller
2-7801 CRTs
Available Apprx 7/1/84
Buy Our Equity and
Take Over Last 12 Months
of FMV Operating Lease
(216) 234-9787

LEVEL 6 & DPS 6 EQUIPMENT
NEW & REFURBISHED
Systems • Peripherals • Memory
CRTs • Applications Software
SUBSTANTIAL DISCOUNTS!!
Boudreau Computer Services Ltd.
100 Bearfoot Rd.
Northboro, MA 01532
(617) 393-6839
TWX 710-347-7574

HONEYWELL DPS 6/76
2-600 LPM Printers
1-1600 BPI Tape Drive
1-80 MB Disk Drive
1-PRT7005 Character Printer
21-VIP7201 CRT's
6-VIP7207 CRT's
25-VIP7311 CRT's
1-VIP7305 CRT
Immediate Availability
(305) 594-4142

WANG

Wang PCs
Famous Wang
Word Processing
& Lotus 1-2-3 &
Twice the speed as IBM
from $3,265.
Immediate Delivery
800-526-0791
201-884-0920
SDE: Your source for
all Wang equipment

ERST Is The Leading Dealer
In WANG Equipment:
2200 • VS • WP • PC
CPUs, Terminals, IOPs,
Controllers, Printers,
Memory Upgrades.
Plug Compatibles.
Rental And Leasing Prices
Quoted On Request.
Call Toll Free:
1-800-FOR ERST
In New York: **(212) 431-1100**
ERST International
Corporation
225 Lafayette Street
New York, NY 10012

BUY - SELL
MVP/LVP • OIS • VS • PC
SYSTEMS IN INVENTORY
VS/80 • MVP • WPS30
AND PERIPHERALS
2246C • 2246R • 5536-4
GENESIS EQUIPMENT MARKETING
GEM
(602) 277-8230

WANG

Psssst...
WANG USERS.....
HAVE YOU HEARD ABOUT THE GROUP OF FORMER WANG EMPLOYEES IN ATLANTA WHO BUY & SELL USED WANG EQUIPMENT AND PLUG COMPATIBLES?
I.C.A. (404) 977-4388 or
1-800-241-3159

NCR

FOR SALE BY OWNER
NCR 9050
COMPUTER SYSTEM
1024 KB Memory
Low speed trunk
I/O Link control
Multiplexor with 6 dual adapter
1-6420 Band printer 600 LPM
with quitlzed cabinet
1-6540 Disk drive 270MB
with Iola (dual) fixed
3-7900 CRT's
7-7901 CRT's
Under NCR maintenance
Call Alberto Hael III
(201) 226-0656

---

658 DISK UNITS
NCR Maint. Avail. Immed.
Harwood International Corp.
100 Northshore Office Park
Chattanooga, TN 37343
Tel. (615)870-5500 Telex #3785691
We supply more NCR Computer Equip.
To More NCR Users
Than Any Other Company,
Except NCR!!

PRIME

PRIME
LARGE SELECTION
OF USED PRIME
COMPUTER SYSTEMS
...SAVINGS TO 50%
Peripherals also available:
Memories-Disk Drives
Controllers-Modems
Terminals-Printers
1st SOLUTIONS
...Your Alternate Source
1st SOLUTIONS, INC.
2001 EAST CAMPBELL AVE.
PHOENIX, ARIZONA 85016
(602) 957-0999
ASK FOR DON OR MATT

IBM

PRINT TRAINS
IBM 1416 & 3216
Bought - Sold - Lease
Repaired - Reconditioned
COMPU-ACT COMPANY, INC.
(813) 883-2461

Buy • Sell • Lease
IBM
Cougar Computer Corp.
Suite 219
26250 Euclid Office Plaza
Euclid, OH 44132
(216) 261-3500

MEMOREX
2051-11
Display Stations
Call 800-328-7938
Data 3 Computer
Corporation

IBM

For Sale or Lease
3278 MOD 2's
From $35 Per Month
3274 Controllers
From $300 Per Month
4341-L2/M2
From $3900 Per Month
4331-L2
From $1940 Per Month
3287-2
From $155 Per Month
SYSCOMP
St. Paul, MN (612) 292-9922
Clearwater, FL (813) 799-4310

BUY SELL LEASE TRADE
S/34 S/36 S/38
Available Now All System 34
Upgrades And Features
5340-C23, E35, F37
5360s All Models
3262s
5256 Model 3s
5251 Model 11s
5291 Model 1s
5251 Model 12s
Immediate Delivery -
Guaranteed IBM Maintenance
PROCOM
"The Professional
Computer People"
(212) 279-1717

New UDS Desktop Modems
201C 2400BPS..........$685 Each
208A/B 4800BPS.....$1610 Each
INSTOCK NOW
QTY DISCOUNTS AVAIL
Call Clark Buch
(818) 994-9400 In Calif.
or (800) 423-2862

FOR SALE BY OWNER
IBM SYSTEM 34
128K 128 MEGS, MAGAZINE DRIVE, COMMUNICATION LINE, 300 LPM PRINTER, IBM MAINTAINED, RIBBONS, MAGAZINES AND MISC. SUPPLIES PRICE $25,000. AVAILABLE JULY 1. CALL 617-281-4660.

3851 Mass Storage Devise
For Sale
3851 Data Cartridges
Available
We Buy & Sell
Contact: Tyus Corporation
(815) 455-6760
6213 Factory Road
Crystal Lake, IL 60014

IBM 4341-L10
4MB, 3 Channel
Available September, 1984
$70,000
OR BEST OFFER
(212) 736-4433 x283

OFF LEASE JUNE 15
CPU's
5340-C23 $6500.
5340-E35 $13750.
COMMUNICATIONS
3274-C31 $10500
Also System 3 Parts
(415) 772-4696
U.S. EQUIPMENT SALES

4341-8 Megs
(M12 or M2)
Available 6/11/84
For Sublease (6-60 months)
36 mo.: $6950
LXX Computers, Inc.
800-241-2384
In GA 404-992-6900

4341-L10
W/1870, 4MB
Now $75,000.
Or Best Offer
Call (214) 991-2911

IBM SYSTEM 34
For Sale or Lease
By Owner User
CPU 64MB 128K
Including Workstation Expansion Unit
5 Years To Pay (Lease Option)
No Interest
IBM Maintenance
For Further Information Call Kathy Coutts at (617) 542-1400

IBM

IBM/34 MODEL F36
Used 21 Months
For Sale to Highest Bidder
For Information Contact
James Schmaedeke
151st and Broadway
Harvey, IL 60426
312/596-1000
Bids Are Due 6/20/84

FOR SALE
3375-A1 w/8150
3375-B1
Available June 1 1984
Call Howard King
Computer Merchants Inc.
(914) 238-9631

FOR SALE
IBM 370/148 K00
3047 Power Unit
Best Offer
(414) 797-6607

SALE OR LEASE
S/38
Model 581
Upgrade To Mod. 6 Available
Available Now
Call Ron Gibb
(914) 238-9631

4341-L1
Available Immediately
4341-M2
Available August 1
Both W/1870
Contact Don Barber
Floating Point Systems
(503) 641-3151

For Sale
IBM SYSTEM 34's
Any Model or Configuration
Disk and Memory Upgrades
Available Within 30 Days
5340-C23 $6,000
Eligible For IBM Maintenance
Call Pat
(313) 852-2311 ext. 5

Fox Computer Sales
Buy • Sell • Rent • Lease
Datapoint • IBM
Teletype
W.T.B.: Used Equipment
195 Alpha Drive.
Cleveland, OH 44143
(216) 449-5205

4331-J1 SYSTEM
w/1421, 1601, 1901, 2001, 3201, 3401, 3701, 4695, 5248, 5531
3370-A1 DISK
3262-1 PRINTER
3411-2 TAPE
$75,000 - NOW
Call Bill Hegan (914) 238-9631

Sale or Lease
5525-051
Admin System
Including: Quantity
5253-1, 5219B2
Call Paul Riess
(203) 226-1279

SALE OR LEASE
S/36
Model B-24
New ITC Qualified
Priced Below IBM List
Will Take System 34 In Trade
Call Ron Gibb
(914) 238-9631

SALE OR LEASE

UNIX	DATE
3380-A4 (Used)	6/27
3880-2 8170, 6550	6/27
4341-L09	Now
3274-B21	6/27

Call: Bill McDermott
(408) 734-3735
Pacific Computer Corp.

Buy .....Sell..... Lease
IBM MICR
3890 - 1419
1255 - 3694
(813) 722-4534

IBM

BUY • SELL • LEASE
IBM
Brown Financial & Leasing Corp.
1702 N. Collins, Suite 211
Richardson, TX 75080
(214) 783-8993

MISC.

Buy • Sell • Lease
• Short Term Rentals •
DATAPOINT
FOR SALE
(2) 4650 Mid System
(3) 6020 128K Processor
(20) 8200 CRTs
(1) 9391 Disk Extension
(1) 9258 300LPM Printer
(1) 9375 Disk Extension
(4) 8601 128K Processors
(1) 9584 Tape Drives
(20) 9462 Multiports
Plus Misc. Memory Boards
AVAIL IMMEDIATELY
Cougar Computer Corp.
(216) 261-3500

BUY - SELL - LEASE
DATAPOINT
HARDWARE & SOFTWARE
•Turnkey Systems •FAMIS Software
On-Line Accounting
(713) 529-9813

NEW & USED
RAISED FLOORING
Immed. del. & quality install.
Serving US, Europe & Scandinavia
Raised Computer Floors, Inc.
6 Sullivan Street
Westwood, NJ 07675
(201) 666-8200, TLX #13-5076

BASIC FOUR

730 CPU
With 288K, 2 8-Way Controls, and 1 Sync. Communication Controller. 2 75 Meg Drives, 12 75 Meg Disk Packs, and 1 UDS 201C Modem.
Dan Moore
Pelikan Inc.
(600) 251-1910

HEWLETT PACKARD

HP DISC DRIVES
7925S 120Mb $8,750
7933H 404Mb $22,900
SAVE THOUSANDS
HP 3000 SERIES 64
Most any configuration upgradeable to Series 68
SAVE AT LEAST $50,000
All items in stock - Immediate delivery. All warranted to qualify for HP Maintenance
ConAm Corporation
1337 Santa Monica Mall, Ste 209
Santa Monica, CA 90401
800/643-4954 CA-213/458-2643
Telex: 215 604 PCS UR

BUY & SELL
150PC/1000/3000
Systems • Components
WESTERN DATA
SALES, INC.
(213) 373-9483

HEWLETT PACKARD

HP 3000
BUY • SELL • RENT • LEASE
Complete Systems
Processors • Peripherals • Parts
ConAm Corporation
Santa Monica, California
(213) 458-2643 (800) 643-4954
Telex: 215 604 PCS UR

Buy-Sell-Lease
HP3000 3X, III, 4X
and related peripherals
Call Carol
CSU INDUSTRIES, Inc.
516-239-4310

PRINTERS

PRINTERS
Decision Data Printer
for your 370, 4331, 4341.
2 year old, 1000 Lpm printer.
For only $15,000
or best offer.
Call Jim Ford 503-231-5050

Fast Dot Matrix Printer
180 CPS sturdy, reliable, 50 programmable functions, graphics.
$1595 New, Asking $1200 or BO
Call (203) 776-6395
or (203) 288-5161
Ask for Andy

BURROUGHS

BUY SELL LEASE
All Systems & Peripherals
AVAILABLE
• B1855 Sys • B1955 Sys
• B90s • B900s
(Configured To Your Specs.)
- **Visual 363 Terminals**
- **SRI Terminals model 100 & 110**
- TD830s, MT983s, MT985s
- 206 & 207 Style Disk Drives
- Various Tape Sub-systems
- Memory Upgrades
- Printers 9246 & 9249 Styles

Guaranteed Burroughs Maint.
Depot Maintenance Available
COMPUTER PROVISIONS
(216) 248-7878
(*Member IBDA*)

B-1000
GENERAL PAYROLL
$3000
National Data
Processing Corp.
P.O. Box 3393
Wilmington, NC 28406

BUY • SELL • LEASE
B1700 • B1800 • B1900
(Custom Config. Install. Avail.)
B20 through B7800
206/207/225/235 Disk
B9246/47/49 Printers
Mag Tape Subsystems
TD830 • MT983 • SRI • Datamaxx
TU/DC/CP/TT Terminals
Installation & DEPOT M/A Available
UFP Corp. (312) 279-1160

More Bulletin Board on the next page.

MISC. SYSTEMS

**FOR SALE/LEASE
USED NIXDORF
EQUIPMENT**
380's, 480's, 600's
tapes, disk, printers
Terminals, and Comm.
METRO SYSTEMS, INC.
P.O. Box 4697 Tulsa, Ok 74104
Bob Millsap, 918-743-5351

Gandalf	Make Offer
Periphonics	Make Offer
Versatec 1600	$1900
TI Printers	From $75
Infoton	$75
Printronix P300	$2850
Emulex CS11	$2000

**Digital Computer Resale
Call (713) 445-0082**

FOR SALE
Nixdorf 8845 Mini
Computer with W/P
LQ PTR
33 MB DISK, 1 DISKT
Contact Gerda Carlson
612/830-2576

DEC

BUY • SELL • TRADE

1123-AA
1124-DC
DZ11-A
DZ11-DP
DZ11-E
LA180-EA
M7258
MK11-CE
RH70
RH780
RM03-AA
RM03-C
RP04/6-C
RP06-AA
TE16 Mstr.
TU80-AA
VT100-AA
VT220

**NEW YORK COMPUTER EXCHANGE
(516)752-8666 (800)645-9109**

FOR SALE
VAX 750
(1 Year Old)
W/Peripherals
(714) 474-1181

DEC

**DEC & PRIME
SPECIALS**

• MS780-FD Avail Now	$3,900
• MS780-E 64K Chip Memory Upgrade Kit	$18,900
• 1144-DA New	$24,600
• VT101-AA New	$975
• RM80-AA	$8,500
• PDP 11/70 CPU Core Memory KB11-C	$25,000
• RMO3-AA New	$5,500
• MS750	$3,195
• CDC 9766 300MB	$8,500
• Dataprinter 1000LPM Band Printer	$3,900
• VAX 780 1/4MB M8210	$695
• LP14-DA	$8,900
• LA38 Unused	$900

- Prime Computer Systems Available Upon Request
- Emulex Controllers Available

**SEVCO INC.
(617) 435-6938
(617) 435-5331**

**DEC
BARGAINS**

11/34A CPU Set	$1,585
11/44 KE44-A 'CIS'	$2,775
4A-Ci780 Spares Kit	$9,800
BDV11-AA	$395
DR780-AA	$7,500
DZ11 MUX Brd.	$1,125
DZ32-A	$2,175
DZ32-B	$1,870
FP11A	$1,185
KK11-A	$1,785
KK11-B	$2,475
KW11-W	$330
MS11-MB	$1,075
MS780-CE	$14,500
MS780-DC	$3,100
MSV11-LK	$875
MSV11-PL	$1,275
RLV11	$775
VAX 1MB MS730-CA	$2,850
VAX 1MB MS750-CA	$2,850

**Call Ray
at QEI, Inc.
(617) 275-6800**

DEC

11/24	**$5,200**
11/44	**$19,995**
2020	**$39,995**
DF03	**$495**
LA120RO	**$1,295**

**Digital Computer Resale
Call (713) 445-0082**

New CDC Disk Drives,
Fully Warranteed For Ninety Days.
Includes Installation, ***Safety Shielded*** Flat Ribbon Cables,
Stand, And Terminator Card.

Call Toll Free: **1-800-FOR-ERST**
In New York: **(212) 431-1100**
ERST International Corporation
225 Lafayette Street
New York, NY 10012

DEC SYSTEMS IN STOCK
Micro PDP-11 w/Winchester Floppy
Micro J-11 w/Winchester Floppy
J-11 Upgrade Kits
J-11 w/RL02's
PDP 11/03 w/RL01's
PDP 11/23 w/RL02's
LA 180 Printers
Competitive Prices, Eligible DEC Maint.
EEC Systems, Inc. (617) 443-5106

DEC & DEC COMPATABLES
Processors PDP 11's
Disks and Tapes
RA60, RK07
Control Data Disk Drives
TWU77, Kennedy 9000, Cipher 75IPS
Terminals
VT100/AVO Special, LA180, LA120
New and Used Disk Packs
Install. & Maint. Services Avail.
Spartan Systems (713) 496-0771

DEC NEW & USED

PDP11/40
PDP11/45
11/70 parts
DB11-A
DD11-CF
DD11-DK
DL11-E
DL11-W
DMC11-DB
DMC11-DA
DMC11-MD
DZ11-C
861-B
861-C
861-E
H7420A
H744
H745
H754
KE44-A
KK11-A
KT11-C
KT11-D
KY11-LB
LA36-CE
LA37-CE
LAX34-CL
LP11-WA
LPV11-WA
LP11 cntl
MK11-BE
RH11
RH780
RK11D
RKV11D
RL01-A
RM05-C
RP04 parts
RP06 parts
RP06-C
TA11-AA
TMB11 cntl
TMB11-EA
TU45-AE
TU77-FB

**PACIFIC COMPUTER
SALES
(208) 322-1112**

DEC

**DEC
INVENTORY
SALE**

11/44, 1MG NEW
11/24-CC NEW
11/34A

*CALL FOR OUR
PERIPHERAL
INVENTORY*
*DISK DRIVES
*CONTROLLERS
*MEMORY
*TAPES
ASK FOR MR. NELSON
(214) 255-1182
CHEVRON COMPANIES/
DELTA INDUSTRIES

VAX 730
RL02/R80
VAX 750
TU80/RA81
VAX 780
2RP07/TU77
**Access
International
Glen Freeman
(617) 367-3690**

We Buy and Sell DEC Systems and Components. Wanted: VAX and 11/70 Processors.

Alphabyte
550 S. State College Blvd.
Fullerton, CA 92631
(714) 680-6511

DEC

**ORLANDO COMPUTER CORP.
BIG SAVINGS ON DIGITAL
EQUIPMENT AND SOFTWARE**
35% Off DEC Rainbows, LA-50 Printers, Monichrome Monitors, and Floor Stands. Software in Stock 50% Off. CPM86/80, Multiplan 86, Select 86, Peachtree Accounting, Super Calc, WordStar, ReportStar, D Base II, C Basic, StarCross, 64K Ram Option, Interface Realtime. Call (904) 371-2842.

DEC

VAX 780 FOR SALE
2MB, (2) RM80, TU77, H7112,
H9602-DF,DZ11-A, LP11-BA,
(4) VT100, VMS & FORTRAN
Available Now
**Lakewood Computer Corp.
P.O. Box 23279
San Jose, CA 95153
(408) 266-2545**

ORDER FORM

COMPUTERWORLD BULLETIN BOARD

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. **Computerworld** comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications include Burroughs, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Sperry Univac, Salvage, Terminals, Misc. Systems and Miscellaneous.

Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be cleanly typewritten. Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $130.00 (One unit minimum and no fractional units allowed.) There are no agency commisions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Issue Date(s):____________________

Signature:____________________

Name:____________________

Title:____________________

Company:____________________

Address:____________________

Telephone:____________________

**Send this form to:
COMPUTERWORLD BULLETIN BOARD
375 Cochituate Road, Box 880,
Framingham, MA 01701
617-879-0700 800-343-6474**

SOFTWARE FOR SALE

**SOFTWARE
CONVERSION
SOLUTIONS**

Dataware provides the software translation system for your complex conversion problems. Over 15 years of conversion experience has resulted in thousands of satisfied customers, worldwide.

- **COBOL to COBOL**
- **AUTOCODER/SPS to COBOL**
- **EASYCODER/TRAN to COBOL**
- **BAL/ALC to COBOL**
- **DOS/ALC to OS/ALC**
- **PL/1 to COBOL**
- **RPG/RPG II to COBOL**
- **RPG/RPG II to PL/1**

Dataware offers services & software to meet your needs. For more information, call or write today

**The Conversion Software People
Dataware, Inc.**
2565 Elmwood Avenue
Buffalo, New York 14217
Phone (716) 876-8722
TELEX: 91519

**IBM SERIES/1
SOFTWARE
TOOL BOX**

Tools for:
- Development
- Application Management
- Data Base Management
- Communications
- EDX Utilities
- Performance Measurement

**H & A Computer Systems
30 Hotaling Place #204
San Francisco, CA 94111
(415)434-3517**

SERIES/1 SPECIALISTS

Quick•Plan
The Executive Project Planning System

ON MS DOS FOR

digital*	RAINBOW +
IBM*	PC
WANG*	PC
HEWLETT PACKARD*	HP 150
Data General*	Desk Top

In worldwide offices on 132 wide printer with 384 K of core, with graphics option.

* Registered Trademarks of Digital, I.B.M., Wang, Hewlett Packard, Data General.

Mitchell
Management
Systems Inc.
FORMERLY STRUCTURAL PROGRAMMING INC
Westborough Office Park
2000 West Park Drive
Westborough, Mass 01581 U.S.A.
Telephone (617) 366-0800

**More IBM
System/38 Users
Are Choosing
RTC Systems.**

For technically superior software in a wide range of Financial, Manufacturing, Distribution and Management Business Systems.

*The International
Software Developers.*

RTC Systems, Inc.
49 Plain Street
North Attleboro, MA 02760
(617) 695-5008

ROBOT 38
unlocks System/38's real power!

For only $20/month, this automated computer operator runs jobs during off-hours and never forgets! New Version 3 adds 19 Enhancements plus 35 ways to cut overtime, free-up disk space, and improve response time.

***For FREE User Guide
CALL TOLL FREE
1-800-328-1000 Ext. 125***

HELP/38 SYSTEMS
*15102 Minnetonka Industrial Rd.
Minnetonka, MN 55343 USA 612/935-3311
Division of Advance Circuits*

**SYSTEM/36
NOTICE**

Scope Publications is now publishing SCOPE/36, the technical journal for the IBM S/36. For sample issue contact:

**Scope Publications, Inc.
Dept. S36-C
P.O. Box 1252
Maitland, FL 32751
(305) 645-2351**

RESULTS

Whether you're buying, selling, swapping, hiring or looking, you get results from **Computerworld classifieds**

Maybe that's why **Computerworld** gets more classified advertising than all the other computer publications put together!

To place your ad, or to get a 1984 rate card with complete details on **Computerworld Classified Advertising,** call or write:

**Computerworld Classified Advertising
P.O. Box 880, 375 Cochituate Road, Framingham, MA 01701
(617) 879-0700; (800) 343-6474**

SOFTWARE FOR SALE

SOFTWARE FOR SALE

Elegant Software
for IBM S/34, S/36 and S/38

General Accounting
Financial Reporting
Accounts Receivable
Accounts Payable
Order Processing
Inventory Management
Sales Analysis
Job Cost

Payroll/Personnel
Property & Equipment
Report Writer
Oil & Gas
All Systems are:
RPG II/RPG III
Data Base
Interactive

J.D. Edwards & Company
4949 South Syracuse Street/Suite 5500
Denver, CO 80237
303/ 773 3732

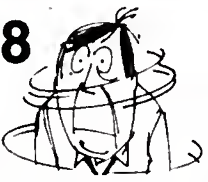
IBM Value Added Remarketer

Dallas — 214/ 458 0636
Houston — 713/ 880 8278
San Francisco Bay Area — 415/ 571 5755
Newport Beach — 714/ 751 5302
Bakersfield, CA — 805/ 327 1911
Tulsa — 918/ 493 1477

SOFTWARE FOR SALE

SOFTWARE FOR SALE

THE SYSTEM/38 AND CRISP



RUN RINGS AROUND THE COMPETITORS CRISP, designed on the System/38 for the System/38, is the one turn-key CUSTOMIZED, FULLY INTEGRATED, ON-LINE, DATABASE, SOFTWARE PACKAGE that utilizes every feature of the System/38. • Sales Order Entry • MRP II • Cost and Financial Accounting • Loading and Dispatching • Inventory Status and Forecasting • Purchasing and Accounts Payable • ....and much, much more.

For additional information on how the System/38 and CRISP can help you, call or write today.

FRIEDMAN & ASSOCIATES, INC.
100 WILMOT ROAD, DEERFIELD, ILLINOIS 60015
(312) 948-7180

SOFTWARE WANTED

Medical Software Wanted

National remarketer of IBM-based medical systems desires marketing rights for medical profession oriented software (e.g. hospitals, clinics, labs, etc.) currently installed on the IBM System 34/36/38/4300 and PC-XT. Please contact:

Don Middleton
VP, Marketing
NMCS
7578 Trade Street
San Diego, CA 92121
(619) 578-9940

TIME & SERVICES

***SPERRY 1100/80 CENTER**
***Mapper *UNIS**
Time Sharing
ON-LINE MANUFACTURING SYSTEMS
ON-LINE FINANCIAL SYSTEMS
DISASTER BACK-UP SERVICE

Contact: Mr. Lloyd Brown
(215) 337-4155

SDS
STARBOARD DATA SERVICES INC.
771 Fifth Avenue
King of Prussia, PA 19406

Tell everybody about the

TIME & SERVICES

you have to offer in the Classified pages of

COMPUTER WORLD

....

To place your ad, send all materials to:

COMPUTER WORLD CLASSIFIEDS

Box 880
375 Cochituate Rd
Framingham,
MA 01701

or call:
1-800-343-6474
in Mass.,
617-879-0700

ICOTECH
Innovative Computer Techniques

COMPUTER SERVICES
IBM 3081 DEC-10

-Remote Job Entry
-Batch Processing
-Optical Mark Reading
-Online Processing
-Timesharing
-Laser Printing

COMPUTER OUTPUT MICROFILM

-Datagraphix Mini Auto-Coms
-Datagraphix Datamaster
-6250 BPI Capability
-Free Testing

Route 202
Raritan, NJ 08869
201-524-0153
Contact: Joyce Bogaenko

COMPUTER TIME
3033-U
4341-2
TSO/CMS
CICS/IMS
Call Pat Holmes
(201) 930-9561
(212) 921-8855

VAX TIME

CHOOSE THE PLAN BEST FOR YOU:
A @ 5¢ CPU SEC & $2 CONNECT HR.
B @ $12 PER CONNECT HOUR
C @ $800/MONTH & 10 MB DISK

NO CPU CHARGES ON PLANS B & C.
PROGRAMMING SERVICES AVAILABLE

AVAILABLE NATIONWIDE VIA TELENET

MIDCOM CORPORATION
(714) 99VAX11
(714) 998-6041

VAX 11/780 AND PDP-11 DEVELOPMENT TIME
NO KILOCORE TICK CHARGES / NO CPU CHARGES
Omnicomputer
$7/$14
RSTS/E VMS
PER HOUR CONNECT TIME
BUDGET BYTES™ 212-944-9230
Omnicomputer, Inc.
1430 Broadway, New York, N.Y. 10018

NVIP INC.

OFFERS THE POWER OF
ONE IBM 3081 (XA)
TWO 3033's (MVS)
AND ONE 3033 (VM)
3800 LASER PRINTING

OPERATING SYSTEMS: MVS, JES2, VM, DOS/VSE, VSE/POWER, VS1

INTERACTIVE: TSO, SPF, WYLBUR, ROSCOE, CICS, CMS, CMS/SPF

REMOTE BATCH: RJE, BISYNC, SDLC, ASYNC

INTERNATIONAL COMMUNICATIONS

COMPILERS: COBOL, FORTRAN, PL1, PL10PT, PASCAL/VS, RPG, BASIC, APL, DUO, FOCUS

APPLICATION PROGRAMS: SAS, SAS GRAPH, TELEGRAPH/DISPLA, ADRSII, IMS, IDMS, EASYTRIEVE, QUIKJOB, SYNCSORT, FDR, LIBRARIAN, UNCLE (CROSSTABS)

SPECIALIZED SERVICES
RESOURCE MANAGEMENT

Dedicated Computer Resources
AVAILABLE 24 HOURS PER DAY,
7 DAYS PER WEEK
COMPLETE TECHNICAL SUPPORT

VERY COMPETITIVE PRICES

CONTACT YOUR NEAREST
NVIP SALES OFFICE
PHILADELPHIA: 215-322-3314
NEW YORK: 212-661-6570
WASHINGTON: 703-522-0888

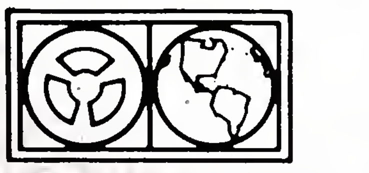
MMI Computer Services Is...
Your Permanent Solution
to Temporary Needs...

☐ Test & Evaluation
☐ Modifications & Upgrades
☐ Component Level Board Repair
☐ Sub-Assembly & Power Supply Repair
☐ Unit Refurbishment & Rebuild
☐ Support of Discontinued Products
☐ Peak Period Repair Support
☐ Manufacturings Test and Repair
☐ Complete Depot Repair Services for Your Product
☐ Your Special Needs

FOR INFORMATION, CALL
DAVID LAU, 214/271-1577

ESTABLISHED - 1976
Centrally located in the Dallas/Ft. Worth Area

MMi
MMI - Computer Services
3020 Lincoln Court
Garland Texas 75041



OUR FINGER ON YOUR SYSTEM'S PULSE™

Consulting Solutions, Inc. offers you any type of software assistance you require for your **Sperry OS/3 Series 90** or **System 80** computer. Our professional staff has many years of OS/3 experience.

- Programming
  - Batch
  - IMS/90
  - TIP30
- UNIS Programming and Consulting
- Systems design
- Internals work (Speedups, Trouble-shooting, etc.)
- Systems software maintenance (patches, new releases, ICAM. Sysgen, IMS/90 gen, TIPgen)
- Conversions

For additional information contact:

Steven S. Gold
212 275-8976

CONSULTING SOLUTIONS, INC.

DEPOT
COMPUTER REPAIRS
DEC-DG-IBM PC
ALL BOARDS
1-2 WEEK TURNAROUND
90 DAY WARRANTY
MEMORIES
POWER SUPPLIES
ANY MANUFACTURER

DIGITAL DATA SYSTEMS.
1551 N.W. 65 Ave., Plantation, FL 33313
305-792-3290
TELEX-232005 ATT DIG

DATA CENTER SERVICES
—✶—
TWO (2) 3033U16

★ OS/MVS/SP
★ VM/370
★ DOS/VSE/SCP
★ CMS
★ TSO/SPF
★ CICS
★ IMS/DBDC
★ RJE
★ TELENET ACCESS

Info Center Products
Access By Micros
EXCELLENT SERVICE LEVELS
COMPETITIVE RATES
VOLUME DISCOUNTS

BURNS COMPUTING SERVICES, INC.

MIDWEST: **312/981-5260**
EAST COAST: **215/398-3600**

COMPUTER TIME RENTAL
IBM 4331
DOS/VSE - ICCS
All Shifts Available
3370 Disk, 3420 Tape
Duel/Density
1403-N1,
2540 Reader/Punch
Reasonable Rates
Contact: Al Palmo
Restamatic Data Services
(212) 997-1411

CDP
COMMERCIAL DATA PROCESSING

4341-2 370/158-3

OS-DOS-VM/CMS
CICS-ROSCOE
REMOTE JOB ENTRY
CICS DEVELOPMENT
CUSTOMIZED SOFTWARE
XEROX LASER PRINTING

Contact Greg Gorab
(201) 777-3454
15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD RIDGE, N.J. 07075

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's
Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Business Opportunities and Real Estate).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $128.10 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $256.20 per insertion. Extra space is available in half-inch increments and costs $64.05. Box numbers are $15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired:__________columns wide by__________inches deep.

Issue Date(s):__________

Section:__________

Signature:__________

Name:__________

Company:__________

Title:__________

Address:__________

Telephone:__________

Send this form to:

COMPUTERWORLD
CLASSIFIED ADVERTISING,
375 Cochituate Road, Box 880,
Framingham, MA 01701

Foreign Editorial/ Sales Offices

England: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London WCI 8UT. Phone: 01-831-9252, Telex: 262346.

Euan Rose, Bill Dunlop, Stephen Thomas, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1V FHN. Phone: 01278 3415/6 (reps for all CWCI publications except Computer Management and Computer Business Europe).

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 38172-0. Telex: 5215350.

France: Axel Leblois, Le Monde Informatique, 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, Paris. Phone: 758.14.14. Telex: 613234 F.

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

H. Kajiyama, Tokyo Representative Group, Sanshin Kogyo Bldg. 3F, 2-10 Kanda Jimbo-cho, Chiyoda-ku, Tokyo 101, Phone: (03) 230-4117/8, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752 COMWOR.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309. Telex: 1771300 ACHAME, 1777809 ACHAME.

Spain: Neil Kelley, Computerworld/Espana, Gravina, 13, Madrid 4. Phone: 231-23-85; 231-23-86; 231-23-88. Telex: 47894(CW E).

Denmark: Preben Engell, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11. Telex: 27566 cwdan.

Sweden: Bengt Mamfeldt, Nova Media, Nova Media AB, Vartavagen 55, 11538 Stockholm. Phone: 08-234280. Telex: 8105099 NOVACW.

The Netherlands: Johannes A. Witvoet, Mgr. Dir., Computerworld Benelux, Van Eeghenstraat 84, 1071 GK Amsterdam. Phone: 020-646426. Telex: (844) 18242.

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.1, Via Rosellini 12, 20124 Milano.

Argentina: Ruben Argento, Gen. Mgr., Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Norway: Mr. Per Berrefjord, Editor, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toeyen, Oslo 6. Phone: 2/647725. Telex: (856) 76476

Southeast Asia: Mr. David Naidu, General Manager, Asia Computerworld, Pte. Ltd., 11-08/11-10 Goldhill Plaza, Newton Road, Singapore. Phone: 250-4444. Telex: (786) RS 37003

Ian Mclean, Asia Computerworld Pte. Ltd., 2023 Swinehouse, 9 Connaught Rd. Central, Hong Kong. Phone: 210395. Telex: (780) 72827 HX COMWR.

Saudi Arabia: Mr. Omar Dusuki, General Manager, Saudi Computerworld, P.O. Box 5455, Jeddah. Phone: 6675916/6650380. Telex: (928) 401205.

ADVERTISERS INDEX

ACX Autovatlve	28
Ad Council	ID/30
ADR	3
Advanced Computer Communications	29,31,33
Agile	130
American International Group	122
American Software	91
Ampex	110-111
Applied Computer	ID/48
Applied Information Development	29
Artificial Intelligence	100
Ashton-Tate	67,98-99
AT&T Technologies	140-141
B I Moyie & Associates, Inc.	ID/36
John Beall	137
Bell & Howeli	124-125
BetaCom	19
Biaha Software, Inc.	31,ID/17
Boeing Comptuer	32
Braegen Corp.	ID/18
Braemar Computer Development	ID/20
Burroughs	12-13
C. Itoh Electronics	36-37
Cambridge Systems	38
CDI Information Systems	82-83
CGA	ID/2
Chicago Soft	33
Cincom	44-45
Codex Corp.	81
Coiiier Jackson, Inc	148
Computer Communications Inc.	131
Computer Corporation of America	135
Computer Power Systems	8
Comshare	41
Control Concepts	30
Control Data Corp.	ID/9-ID/16
Corodale	46
CPT, Inc.	ID/29
CRWTH Computer Coursewares	18
Cullinet Software	145-147
CW Circulation	129
CW Denmark	ID/17
CW Supplement	143
Data Design Associates	56
Data Knowledge	ID/43
Dataiex	24
Dataserv	114
Datastream	59
Deitak, Inc	96,136
Diablo Systems	22
Dlgilog	ID/3
Digital Communications Associates	102-103
Digital Controls Corp.	ID/8
Digital Datacom	144
Digital Equipment Corp.	ID/44-ID/45
Digital Source	6
Dimension Data	58
D.J.C. Corp.	105
D.M. Computer Corp.	108
Dow Jones News/Retrieval	58
Dow Jones Software	134
ESPN	154
Exxon Office Systems	10-11
Fischer Innis	97
Florida Data Corp.	128
Four Phase Systems	115-117
Fujitsu	152
Fusion Products	ID/34
Gandalf Data	50
Ganesa	126
General Electric	54-55,94,138-139
Genicom	101
Goal Systems	ID/47
Gouid Inc.	84-85
Graham Magnetics	75
Group Operations	ID/36
H & W Computer	50
Hayes Microcomputer	62
Hogan Systems	ID/40
Honeywell	27
Hotsite	79
Hughes Aircraft	63
IBM	60-61,ID/4-ID/5
IBM-ISG	134
Infodata	7
Informatics	ID/23
Infotech	18
Infotron	43
Innovative Electronics	34
Integral Systems, Inc.	ID/30
Intei	ID/7
Interface Systems	95
International Software Technology	86
IPL Systems	48
ISC Systems Corp.	57
ITT Courier	ID/38-ID/39
Kaufman Data Communications	ID/22
J.W. Lampi, Inc.	ID/35
Lawson Associates	148
LDI Disaster Recovery Corp.	80
Local Data	ID/28
3M	26
MacMillan Book Club	90
Manager Software Products	ID/48
MCBA	42
McCormack & Dodge	188
Megateck Corp.	25
Memorex	64-65
Michaels, Ross & Coie	37
MicroFrame	50
MlcroRim	132-133
Microtempus	120
Multi Solutions	28
Mike Murach & Associates Inc.	ID/8
NameLab	ID/28
National Information Systems	80
NCR Comten, Inc.	118
NEC	ID/34
New Generation Software	148
Northern Telecom	92-93,150-151
Okidata Corp.	70
Panasonic	ID/21
Pansophic Systems	107
Philips Information Systems	119
Philon	47
Pilot Executive Software	112
Quality Micro Systems	23
Questronics	40
Qume	104
SAS Institute	ID/24-ID/25
Schonfeld & Associates, Inc.	ID/42
Signal Technology, Inc.	ID/26
SIR, Inc.	71
Softool	ID/26
Softrend, Inc.	76-77
Software Corp. of America	106
Software International	52-53
Software Results	57
Southern CA Delivery Service	ID/28
STSC	34
Synapse Computer	49
Syncsort	5
Sysed	50
Tandberg Data Inc.	158
Tandem Computers	20-21
Techiand Systems	74
Tektronix Inc.	108-109
Teievideo Systems	78,ID/46
Texas Instruments	123
3COM	72-73
Tolerant Systems	87
Tominy	16
Tone Software	6
Topaz	ID/32,155-157
Toshiba	51
Total Assets Protection	ID/43
Triangle Software	35
Tymnet	ID/31,ID/33,ID/35
UniForum	148
Universal Data Systems	142
Visual Computer	68-69
Visual Technology	149
VM Software	9
Votan, Inc.	66
Wang Laboratories	39
Western Union	ID/6
Zilog Inc.	ID/37

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Sales Offices

Vice-President/Sales/Donald E. Fagan
Director/National Sales/Edward P. Marecki
Manager/Marketing & Sales Operations/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701
(617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
Northern Regional Manager/Ronald Mastro
District Managers/Jim McClure, Jayne Donovan,
Michael F. Kelleher
Sales Assistant/Alice Longley
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701

CHICAGO SALES OFFICE (312) 827-4433
District Managers/Arthur Kossack, Russ Gerches
Sales Assistant/Jean F. Broderick
COMPUTERWORLD, 2600 South River Road, Suite 304,
Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Director/Michael J. Masters
Senior District Manager/Doug Cheney
District Managers/Ray Corbin, Joan Daly, Fred Lo Sapio
Sales Assistant/Gale M. Paterno
COMPUTERWORLD, Paramus Plaza I,
140 Route 17 North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 261-1230
Senior District Manager/Bob Hubbard
District Manager/Bernie Hockswender
Western Regional Director/William J. Healey
COMPUTERWORLD, 18008 Sky Park Circle, Suite 260,
Irvine, CA 92714

SAN FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Director/William J. Healey
Senior District Manager/Barry Milione
District Manager/Ernie Chamberlain
Account Manager, Classified/Nicole Boothman
Account Manager/Debora Cramer
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
District Manager/Jeffrey Melnick
Eastern Regional Director/Michael J. Masters
COMPUTERWORLD, 1853 Peeler Road, Suite D,
Atlanta, GA 30338

HOUSTON SALES OFFICE (713) 952-1220
District Manager/William Mahoney
Western Regional Director/William J. Healey
COMPUTERWORLD, 8401 Westheimer, Suite 110,
Houston, TX 77063

CLASSIFIED ADVERTISING (617) 879-0700
Al DeMille
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701

CW INTERNATIONAL MARKETING SERVICES
General Manager/Diana La Muraglia
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701
(617) 879-0700
Manager, West Coast/Peter Crockett
COMPUTERWORLD, 1060 Marsh Road
Menlo Park, CA 94025
(415) 328-8064

CW COMMUNICATIONS/INC.

Board Chairman/Publisher
Patrick J. McGovern
President
W. Walter Boyd
Senior Vice-President
Lee Vidmer

Group VP-Communication Services, Jack Edmonston. **Group VP-Circulation**, Margaret Phelan. **VP-Marketing**, Donald E. Fagan. **VP-Finance**, William P. Murphy. **VP-Editorial**, John Whitmarsh.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701
Phone: (617) 879-0700, Telex: 95-1153.

SALES **Vice-President**, Donald E. Fagan. **National Director**, Edward P. Marecki. **Corporate Advertising Administrator**, Frank Collins. **Manager/Marketing & Sales Operations**, Kathy Doyle.
Display Advertising Supervisor, Anne Hadley.
Display Advertising, Deborah Bryer, Pam Valentinas, Carolyn Medeiros, Cindy Chekas, Mary Waddick. **Classified Operations Manager**, Cynthia Delany.

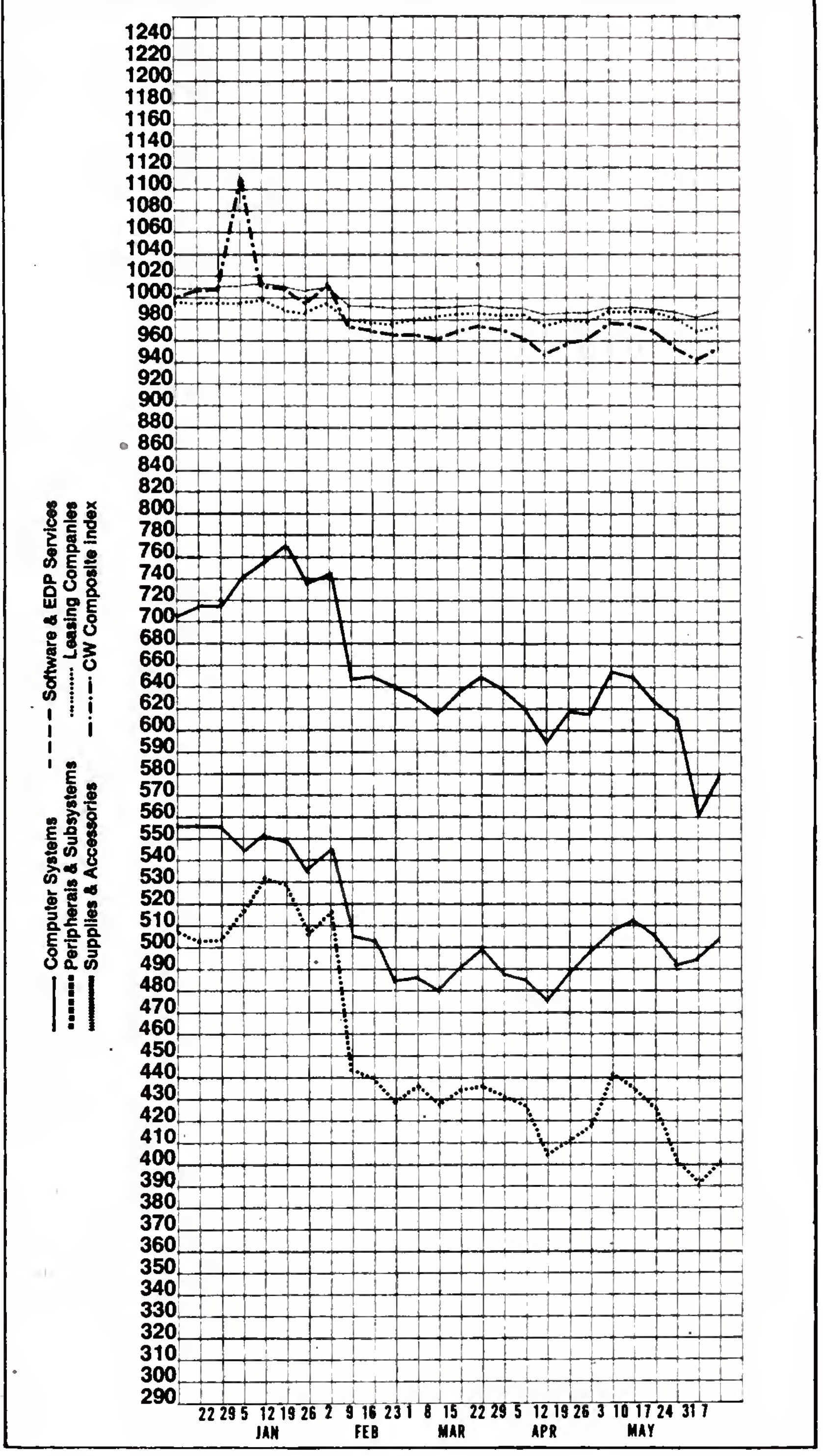
COMMUNICATION SERVICES **Group Vice-President**, Jack Edmonston. **Director Research**, Kathryn Dinneen.
Sales Promotion Director, Liz Johnson.

PRODUCTION **Production Director**, Peter Holm. **Production Manager**, Marlene Stibal.
Paste-Up Manager, Trish Gaudette. **Systems Manager**, Tom Pfau.
Typesetting Manager, Carol Polack. **Art Director**, Tom Monahan.
Graphic Designer, Hank Fling.

CIRCULATION **Group Vice-President**, Margaret Phelan. **Circulation Manager**, Jane Desberg.
Fulfillment Manager, Maureen Burke.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Peridoical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

Computerworld Stock Trading Index



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 6, 1984

All statistics compiled, computed and formatted by
TRADE QUOTES, INC
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1983-84 RANGE (1)	CLOSE JUNE 6 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	11- 24	12 1/4	+ 1/2	+4.2
O	ALTOS COMPUTER SYST	8- 28	10 1/8	+ 5/8	+6.5
A	AMDAHL CORP	9- 30	11 3/4	0	0.0
O	APPLE COMPUTER INC	18- 63	29	0	0.0
N	AT&T	15- 70	15 1/8	- 3/8	-2.4
N	BURROUGHS CORP	28- 58	51 1/8	+1 3/4	+3.5
O	COMPUTER AUTOMATION	6- 17	6 7/8	+1 1/8	+18.5
A	COMPUTER CONSOLES	8- 26	18	+1 1/8	+6.6
N	CONTROL DATA CORP	21- 62	31 1/2	+1 1/8	+3.7
O	CONVERGENT TECHNOL	12- 41	14 1/4	+1 3/8	+10.6
N	CRAY RESEARCH INC	20- 58	46 3/8	+3 5/8	+8.4
N	DATA GENERAL CORP	10- 49	47 1/2	+3 3/8	+7.6
N	DATAPOINT CORP	11- 36	22 1/2	+1 1/8	+5.2
N	DIGITAL EQUIPMENT	62-132	91	+5 5/8	+6.5
A	EECO INC	6- 16	14 1/8	+1 3/8	+10.7
N	ELECTRONIC ASSOC.	5- 15	6	+ 5/8	+11.6
N	FLOATING POINT SYST	13- 44	15 1/2	+ 1/8	+0.8
N	FOXBORO	22- 47	32 1/4	+ 1/4	+0.7
O	GENERAL AUTOMATION	3- 18	9 1/2	- 1/2	-5.0
N	GOULD INC	24- 44	27 1/4	+3 1/2	+14.7
N	HARRIS CORP	20- 51	28	+ 1/4	+0.8
N	HEWLETT-PACKARD CO	22- 48	35 1/8	+1	+2.9
N	HONEYWELL INC	28- 69	50 1/2	+1 5/8	+3.3
N	IBM	57-134	105 3/4	-1 1/2	-1.3
O	IPL SYSTEMS INC	4- 14	5 1/4	+ 3/4	+16.6
N	M/A-COM INC	13- 35	17 1/2	+2 1/8	+13.8
N	MANAGEMENT ASSIST	7- 26	22 3/4	+1 5/8	+7.6
N	MATSUSHITA ELEC(ADR)	47- 88	74 3/4	+ 3/4	+1.0
N	MODULAR COMPUTER SYS	8- 18	7	+ 1/4	+3.7
N	MOHAWK DATA SCI	9- 19	8 3/4	- 1/2	-5.4
N	MOTOROLA INC	11- 49	34 3/8	-1 1/8	-3.1
N	NAT'L SEMICONDUCTOR	12- 60	12	- 1/4	-2.0
N	NBI INC	17- 51	21 1/2	+2 1/4	+11.6
N	NCR	10- 34	25 5/8	0	0.0
N	PERKIN-ELMER	17- 37	22 5/8	+1 7/8	+8.0
N	PRIME COMPUTER INC	11- 30	13 1/2	+ 3/8	+2.8
N	SPERRY CORP	21- 50	37 7/8	+1 5/8	+4.4
O	TANDEM COMPUTERS INC	14- 40	21 3/8	+2 7/8	+15.5
N	TANDY CORP	28- 85	26 7/8	- 1/4	-0.8
O	TELEVIDEO SYSTEMS	7- 41	7	- 1/2	-6.8
O	TELXON CORP	8- 18	10 1/4	+1	+10.8
N	TEXAS INSTRUMENTS	71-176	133 1/2	+3 7/8	+2.9
A	ULTIMATE CORP	8- 24	18 1/2	+1 1/8	+6.4
O	VECTOR GRAPHICS INC	1- 14	1	- 1/8	-11.1
A	WANG LABS "B"	13- 42	26	+2	+8.3
A	WANG LABS "C"	11- 42	26 1/2	+1 7/8	+7.6
N	XEROX CORP	35- 52	37 7/8	+ 3/4	+2.0

LEASING COMPANIES

EXCH		1983-84 RANGE (1)	CLOSE JUNE 6 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	8- 21	18 1/2	0	0.0
N	COMDISCO INC	7- 42	11 3/4	- 1/2	-4.0
O	CONTINENTAL INFO SYS	3- 18	6 1/2	+ 1/4	+4.0
N	DPF INC	5- 15	12 1/8	+1 3/8	+12.7
O	PHOENIX AMERICAN INC	6- 17	6 1/4	- 3/4	-10.7
O	SELECTERM INC	11- 21	14 1/2	+ 1/2	+3.5
N	U.S. LEASING	18- 47	32 1/4	+1	+3.1

COMPONENTS

EXCH		1983-84 RANGE (1)	CLOSE JUNE 6 1984	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	13- 37	33	+1 1/2	+4.7
O	ADV'D SEMICONDUCTOR	12- 38	22	+ 3/4	+3.5
N	ANALOG DEVICES INC	14- 32	23	+1 3/8	+6.3
O	ANALOGIC CORP	14- 27	14 1/2	- 3/8	-2.5
N	APPLIED MAGNETICS CP	12- 37	13 3/4	+ 7/8	+6.7
N	TERADYNE	14- 39	28	+2 1/4	+8.7

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1983-84 RANGE (1)	CLOSE JUNE 6 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 8	2 5/8	+ 1/8	+5.0
O	ADVANCED SYSTEMS INC	6- 22	15 1/8	+ 1/8	+0.8
O	AGS COMPUTERS INC	7- 32	17 3/4	+1	+5.9
O	AMERICAN SOFTWARE	13- 31	13 1/2	+ 1/2	+3.8
N	ANACOMP INC	2- 23	3 5/8	+ 3/8	+11.5
O	ANALYSTS INTL CORP	5- 20	5	+ 1/4	+5.2
A	APPLIED DATA RES.	8- 37	20	+1 1/4	+6.6
O	ASK COMPUTER SYSTEMS	6- 21	14 1/4	+ 1/4	+1.7
B	ASTRADYNE COMP IND	1- 7	1 1/4	0	0.0
N	AUTOMATIC DATA PROC	21- 44	34	+1 1/8	+3.4
O	CGA COMPUTER ASSOC	5- 17	9 1/2	+ 1/8	+1.3
O	COMPUTER ASSOC INT'L	6- 35	17	+1	+6.2
O	COMPUTER HORIZONS	8- 20	10	+ 1/2	+5.2
O	COMPUTER NETWORK	4- 10	5 3/8	+ 1/4	+4.8
N	COMPUTER SCIENCES	11- 23	12 1/2	+ 1/2	+4.1
O	COMPUTER TASK GROUP	8- 22	13 3/4	- 1/4	-1.7
O	COMPUTER USAGE	2- 22	6 1/2	- 1/4	-3.7
O	COMPUTONE SYSTEMS	4- 38	5 1/8	+ 3/4	+17.1
O	COMSERV CORP	2- 20	3	+ 1/8	+4.3
O	COMSHARE	7- 14	7 3/4	+ 1/8	+1.6
N	CULLINET SOFTWARE	12- 50	32 1/2	+1 3/4	+5.6
O	CYCARE SYSTEMS INC	9- 27	17	- 1/4	-1.4
N	ELECTRONIC DATA SYST	10- 42	38	+2 1/2	+7.0
O	HOGAN SYSTEM INC	13- 27	13	- 1/2	-3.7
N	GENERAL ELECTRIC CO	45- 58	53 1/4	+1 1/4	+2.4
N	GTE CORP	38- 48	38 7/8	+ 5/8	+1.7
N	INFORMATICS INC	10- 34	21 1/2	+1 1/2	+7.5
O	INFORMATION SCIENCE	7- 17	6 1/2	-1	-13.3
O	INFOTRON SYSTEMS COR	25- 43	28 3/4	+1 1/2	+5.5
O	KEANE ASSOCIATES	4- 15	9 3/4	+ 3/4	+8.3
A	LOGICON	8- 31	20 3/4	+1	+5.0
O	MCI COMMUNICATIONS	8- 34	8	0	0.0
O	MNGT SCI AMER INC	8- 33	19	+2 3/4	+16.8
O	MATHEMATICAL APP GRP	7- 22	7 1/2	0	0.0
O	MICOM SYSTEMS INC	25- 50	40	+3	+8.1
O	MONCHIK-WEBER CP	6- 22	7 1/4	- 1/4	-3.3
O	NATIONAL DATA CORP	5- 26	15 3/4	- 3/8	-2.3
O	ON-LINE SOFTWARE INT	8- 27	9	0	0.0
O	PANSOPHIC SYSTEMS	8- 30	14 1/2	+1 1/8	+8.4
N	PLANNING RESEARCH	6- 21	15 1/4	+ 3/8	+2.5
O	POLICY MGMT SYSTS CP	15- 35	25 3/4	+1 1/2	+6.1
O	PROGRAMMING & SYS	1- 8	4 7/8	+ 3/8	+8.3
O	REYNOLDS & REYNOLD	17- 53	30 3/4	-1	-3.1
O	SEI CORP	11- 34	14 3/4	+1 1/2	+11.3
O	SHARED MEDICAL SYST	13- 43	29	+1 3/4	+6.4
O	SCIENTIFIC COMPUTERS	6- 14	7 3/4	- 1/4	-3.1
O	SOFTWARE AG	5- 17	10 1/4	+ 1/8	+1.2
A	URS CORP	5- 18	11 1/2	+ 3/4	+6.9
N	WYLY CORP	7- 17	9 1/8	+ 7/8	+10.6

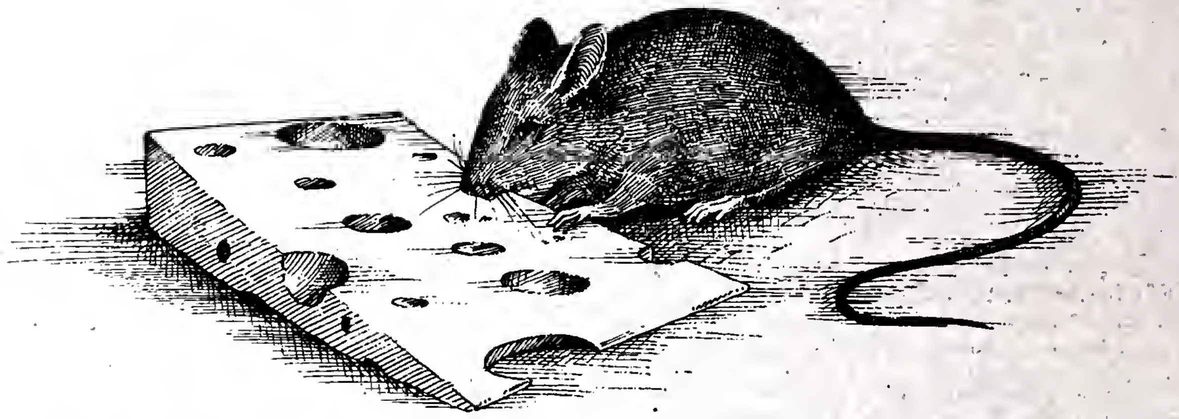
PERIPHERALS & SUBSYSTEMS

EXCH		1983-84 RANGE (1)	CLOSE JUNE 6 1984	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	2- 7	3 3/8	- 1/8	-3.5
A	ANDERSON JACOBSON	7- 26	9 3/8	+1 7/8	+25.0
O	AUTO-TROL TECHNOLOGY	8- 29	16 1/4	+1 1/4	+8.3
O	BANCTEC INC	7- 33	7	0	0.0
A	BEEHIVE INT'L	3- 15	3 1/8	+ 3/8	+13.6
N	BOLT,BERANEK & NEW	5- 30	18 1/4	+ 3/8	+1.8
O	CAMBEX CORP	1- 4	1 1/4	0	0.0
N	CENTRONICS DATA COMP	8- 28	10 1/8	- 1/8	-1.2
A	CETEC CORP	4- 12	7 7/8	0	0.0
O	COGNITRONICS	2- 20	5 3/4	+ 1/8	+2.2
O	COMPUTER DEVICES INC	0- 21	5/8	+	+11.0
O	COMPUTER TRANSCEIVER	2- 12	2 1/8	- 1/8	-5.5
N	COMPUTERVISION CORP	19- 53	39 1/4	+3 7/8	+10.9
N	CONRAC CORP	14- 38	13 7/8	- 1/8	-0.8
A	DATAPRODUCTS CORP	16- 41	19 1/4	+1 5/8	+9.2
A	DATARAM CORP	5- 12	8	- 1/8	-1.5
O	DATA SWITCH CORP	13- 41	20	+1	+5.2
O	DATUM INC	2- 17	6 1/8	- 1/8	-2.0
O	DECISION DATA COMPUT	3- 16	10 1/8	+1 3/8	+15.7
O	DOCUTEL-OLIVETTI	7- 39	8 7/8	+1	+12.6
N	ELECTRONIC M & M	5- 11	6 5/8	+ 5/8	+10.4
O	ENDATA, INC	9- 16	10 1/2	+ 1/2	+5.0
O	EVANS & SUTHERLAND	17- 50	17 3/4	+ 1/2	+2.8
O	GANDALF TECHNOLOGIES	9- 22	10 5/8	- 1/8	-1.1
N	GEN'L DATA COMM IND	3- 17	15	+1 7/8	+14.2
O	GREAT SOUTHWEST IND	1- 6	3/4	0	0.0
N	HAZELTINE CORP	7- 31	25 7/8	+ 3/4	+2.9
O	ICOT CORP	3- 10	3 1/4	+ 1/4	+8.3
O	INFORMATION INTL INC	10- 22	10 3/4	0	0.0
O	INTEL CORP	11- 45	34	+3 1/4	+10.5
O	IPL SYSTEMS INC	4- 14	5 1/4	+ 3/4	+16.6
A	LUNDY ELECTRONICS	7- 19	9 1/8	+ 1/8	+1.3
O	MEGADATA CORP	8- 15	9 1/4	+ 3/4	+8.8
A	MSI DATA CORP	13- 37	13 1/2	+ 1/8	+0.9
N	NASHUA CORP	9- 29	27	+1 3/4	+6.9
O	NETWORK SYSTEMS CORP	8- 34	21 3/4	+1 3/8	+6.7
N	NO AMERICAN PHILIPS	17- 40	31 1/4	+1	+3.3
N	NORTHERN TELECOM LTD	22- 49	32 3/4	+2 1/8	+6.9
O	OMEX	1- 6	1/4	0	0.0
N	PARADYNE CORP	13- 30	15 5/8	+ 5/8	+4.1
A	PENRIL CORP	7- 14	12	+ 1/2	+4.3
O	PHOENIX AMERICAN INC	6- 17	6 1/4	- 3/4	-10.7
N	PLESSEY CO (ADR)	26- 41	30	+2 1/4	+8.1
O	PRINTRONIX INC	19- 34	20 1/4	+ 1/2	+2.5
O	RAMTEK CORP	8- 26	8 1/4	- 1/4	-2.9
N	RECOGNITION EQUIP	4- 17	11 1/2	+ 1/2	+4.5
N	ROLM CORP	30- 80	34 3/4	+1 5/8	+4.9
N	SANDERS ASSOCIATES	36-120	40 1/4	+2 7/8	+7.6
O	SCAN DATA	1- 3	3/8	0	0.0
O	SCAN-TRON CORP	12- 19	13 5/8	+ 3/8	+2.8
N	SCIENTIFIC ATLANTA	9- 23	9 1/2	- 1/8	-1.2
N	STORAGE TECHNOLOGY	9- 33	9 3/8	- 1/4	-2.5
O	SYKES DATATRONICS	3- 27	2 7/8	- 1/8	-4.1
O	SYSTEMS & COMP TECH	20- 39	24 1/4	+3	+14.1
A	T BAR INC	7- 17	9 1/2	+ 5/8	+7.0
A	TAB PRODUCTS CO	5- 20	14 1/2	0	0.0
O	TANDON CORP	9- 35	8 5/8	- 3/4	-8.0
A	TEC INC	6- 12	10 3/4	+ 1/8	+1.1
N	TEKTRONIX INC	34- 87	57 1/4	+1 1/2	+2.6
N	TELEX	5- 32	22 5/8	+ 1/8	+0.5
O	TESDATA SYSTEMS CP	3- 17	4 5/8	0	0.0
N	TIMEPLEX INC	7- 29	14 1/4	+ 1/2	+3.6
O	VISUAL TECHNOLOGY	9- 26	11 3/4	0	0.0

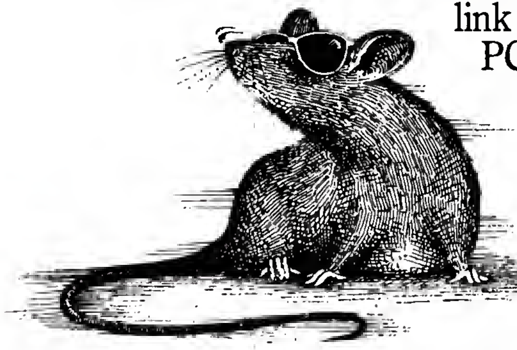
SUPPLIES & ACCESSORIES

EXCH		1983-84 RANGE (1)	CLOSE JUNE 6 1984	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	7- 23	20 1/4	- 1/2	-2.4
N	BARRY WRIGHT	13- 33	25 3/8	+ 7/8	+3.5
A	DUPLEX PRODUCTS INC	12- 27	23	0	0.0
N	ENNIS BUS. FORMS	6- 28	21	+ 1/2	+2.4
N	3M COMPANY	49- 90	76 1/2	+3 1/8	+4.2
N	MOORE CORP LTD	26- 51	37 1/4	+ 1/2	+1.3
O	STANDARD REGISTER	11- 35	34 1/2	+1 1/4	+3.7
N	WALLACE COMP SERVICE	11- 33	25 1/2	+ 1/4	+0.9

THE BIG THREE IN BUSINESS SOFTWARE. BEFORE YOU BUY, SEE HOW THEY RUN.



Run their general ledger. Their payroll/personnel. Their entire product line of financial and human resources software. Run the packages on your mainframe and link them to your PC's. Run them together and see if they work together.



You may well conclude that even though each of the big three has succeeded in business, only one of them has succeeded at integrating business application software.

And if your company size is $100 million in sales or more, this discovery could spare you the pain of much lost time and money over the next few years. Because when you acquire a half dozen systems that fit together in name only—but not in fact—you face six times the training, six times the delay and six times the anxiety.

We believe your evaluation will show you this:

Two companies offer the mere appearance of integration. An agglomeration of business applications linked superficially. Through a web of hinges, patches, bridges, shadow files and masks lurking just below the surface.

While one offers the real thing. Millennium. A true family of systems in which the whole works as smoothly as any part. In which every package has the same query mechanism, the same report writers, the same screen generation, the same on-line documentation, security and real-time capabilities. So that when the packages are put together, there are absolutely no borders between them. They fit like pieces in a jigsaw puzzle. Making the most efficient use of all your data processing resources.

There's even a Millennium application development tool, so you can create new systems as you need them. Without slow, expensive programming.

Millennium means integration in fact. Not just in name. And it is available only from McCormack & Dodge.

Of the big three in software, who's blind to integration and who's not?

When you see how they run, you'll know the answer.

WHEN YOU THINK ABOUT TOMORROW, MILLENNIUM MAKES SENSE TODAY.

McCormack & Dodge

a company of
The Dun & Bradstreet Corporation

McCormack & Dodge Corporation, 1225 Worcester Road, Natick, MA 01760
Sales and support offices throughout North and South America, Europe, Asia, Australia and Africa. 800-343-0325. Telex: 710-325-0329